

IMPROVEMENT OF COORDINATION IN THE MULTI-NATIONAL MILITARY
COORDINATION CENTER OF THE NEPAL ARMY
IN RESPOND TO DISASTERS

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

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Fort Leavenworth, Kansas
2017

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REPORT DOCUMENTATION PAGE				<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
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1. REPORT DATE (DD-MM-YYYY) 9-06-2017		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) AUG 2016 – JUN 2017	
4. TITLE AND SUBTITLE Improvement of Coordination in the Multi-National Military Coordination Center of the Nepalese Army in Respond to Disasters				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Basanta Bahadur Gautam, Major				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301				8. PERFORMING ORG REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT <p>On 25 April 2015, Nepal was hit by a 7.8 magnitude earthquake killing 9,979 and wounding hundreds more. This study examines the contribution made by the Nepalese Army (NA) in the establishment and implementation of the Multi-Nation Military Coordination Center (MNMCC) to coordinate the disaster assistance effort of 18 Multi-National Force (MNF), and its troops. The findings show the existence of coordinating challenges faced by the MNMCC throughout the process. The paper explores the details and determines the changes needed in processes and procedures of the Government of Nepal (GoN) to establish the MNMCC as an effective coordinating mechanism. The research follows the case study method utilizing the Capability Based Analysis (CBA) approach to scrutinize the data collected. The study identifies the range of coordination challenges and causes behind it through the Doctrine, Organization, Leadership and Education, and Policy lenses. Concurrently, the study recommends the NA and the Government of Nepal (GON) to continue the best practice of conducting various disaster-related international and regional training and exercises. It further suggests in increasing bilateral, regional, and multilateral agreements with potential countries and subsequently, recommends in maintaining a robust information database to enhance assistance effort and eliminated duplication</p>					
15. SUBJECT TERMS Disaster Response, Coordination Center, Multi-national, Coordination Challenges, National Disaster Response Framework					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT (U)	b. ABSTRACT (U)	c. THIS PAGE (U)			19b. PHONE NUMBER (include area code)

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

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Center of the Nepalese Army in Respond to Disasters

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

IMPROVEMENT OF COORDINATION IN THE MULTI-NATIONAL MILITARY COORDINATION CENTER OF THE NEPALESE ARMY IN RESPOND TO DISASTERS, by Major Basanta Bahadur Gautam, 125pages.

On 25 April 2015, Nepal was hit by a 7.8 magnitude earthquake killing 9,979 and wounding hundreds more. This study examines the contribution made by the Nepalese Army (NA) in the establishment and implementation of the Multi-Nation Military Coordination Center (MNMCC) to coordinate the disaster assistance effort of 18 Multi-National Force (MNF), and its troops. The findings show the existence of coordinating challenges faced by the MNMCC throughout the process. The paper explores the details and determines the changes needed in processes and procedures of the Government of Nepal (GoN) to establish the MNMCC as an effective coordinating mechanism. The research follows the case study method utilizing the Capability Based Analysis (CBA) approach to scrutinize the data collected. The study identifies the range of coordination challenges and causes behind it through the Doctrine, Organization, Leadership and Education, and Policy lenses. Concurrently, the study recommends the NA and the Government of Nepal (GON) to continue the best practice of conducting various disaster-related international and regional training and exercises. It further suggests in increasing bilateral, regional, and multilateral agreements with potential countries and subsequently, recommends in maintaining a robust information database to enhance assistance effort and eliminated duplication.

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ACRONYMS

AAR	After Action Review.
CBA	Capability Based Assessment
CNDRC	Central Natural Disaster Relief Committee
DMO	Directorate of the Military Operations
DOLP	Doctrine, Organization, Leadership and Education, and Policy
DOTMLPF	Doctrine, Organization, Training, Leadership and Education, Policy, and Finance
FAA	Functional Area Analysis
FNA	Functional Need Analysis
FSA	Functional Solution Analysis
GoN	Government of Nepal
HuMOC	Humanitarian-Military Operations Coordination Center
INSARAG	International Search and Rescue Advisory Group
JCC	Joint Coordination Center
LCA	Logistics Capacity Assessment
LEMA	Local Emergency Management Authority
MNF	Multi-National Forces
MNF-SOP	Multinational Force Standing Operating Procedures
MNMCC	Multi-National Military Coordination Center
MoHA	Ministry of Home Affairs
NA	Nepalese Army
NDRF	National Disaster Response Framework
NEOC	National Emergency Operation Center

NSET	National Society for Earthquake Technology
OCHA	Office for the Coordination of Humanitarian Assistance
OSOCC	On-Site Operation Coordination Center
PEER	Program for Enhancement of Emergency Response
SAARC	South Asian Association for Regional Cooperation
SAR	Search and Rescue
SDMRAF	SAARC Disaster Management Rapid Action Force
SOP	Standing Operating Procedures
UNDAC	United Nations Disaster Assessment and Coordination
USAR	Urban Search and Rescue
VOSOCC	Virtual On-Site Operaton Coordination Center

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CHAPTER 1

INTRODUCTION

Background

Nepal is a landlocked country in South Asia that is vulnerable to various natural hazards. Nepal is one of the world's 20 most disaster prone countries, and regarding seismic vulnerability, it ranked the 11th most at-risk country in the world (Center for Excellence in Disaster Management and Humanitarian Assistance 2015, 26-30). Disasters in Nepal have accounted for many lives and destruction of infrastructures. The 7.8 magnitude earthquake that hit Nepal on April 25, 2015, was a devastating natural disaster that resulted in 9,979 deaths. The Government of Nepal (GoN) responded to that earthquake by mobilizing its resources, and by coordinating international assistances according to its National Disaster Response Framework (NDRF). As provisioned in the NDRF, the Multi-National Military Coordination Center (MNMCC) played a crucial role in integrating national and international military resources. Despite the effort from all the sectors, the operation was riddled with inefficiencies. Lack of vital essence in the coordination of the mission made it incompetent in quick and proper response. Improving the MNMCC's coordination is essential to increase the effectiveness of the Multinational Military Forces' (MNFs) assistance in future disaster responses. Thus, this paper aims at determining ways to improve the MNMCC's coordination capability and effectiveness, based on lessons from this particular earthquake.

This paper is divided into five chapters. The first chapter provides the background and introduces the thesis. It will provide the problem statement, research question, assumptions, scope and limitations, delimitations, and the significance of the study. The

second chapter organizes a review of the related literature. The third chapter describes regarding how this thesis utilized the Capability Based Analysis (CBA) approach is employed as a research methodology. The fourth chapter analyzes the relevant information derived from the third chapter to determine the ways to improve coordination of the MNMCC. Finally, the fifth chapter offers significant findings, conclusion and the recommendations.

The terrain configuration and the geographic situation of Nepal make it susceptible to various disasters. Its topography and location place it in a disaster risk zone. The active seismic topography, dense precipitation, and steep terrain configuration have resulted in many disasters such as earthquakes, landslides, floods and fire (Guosheng 2012). Located on the Alpine belt (Alpine-Himalayan), it is highly susceptible to damage from a wide range of natural disasters including floods, landslides, and earthquakes (Center for Excellence in Disaster Management and Humanitarian Assistance 2015). Figure 1 displays the United Nations Office for the Coordination of Humanitarian Assistance (OCHA) hazard map regarding the metrological and seismic hazards potential in Nepal.

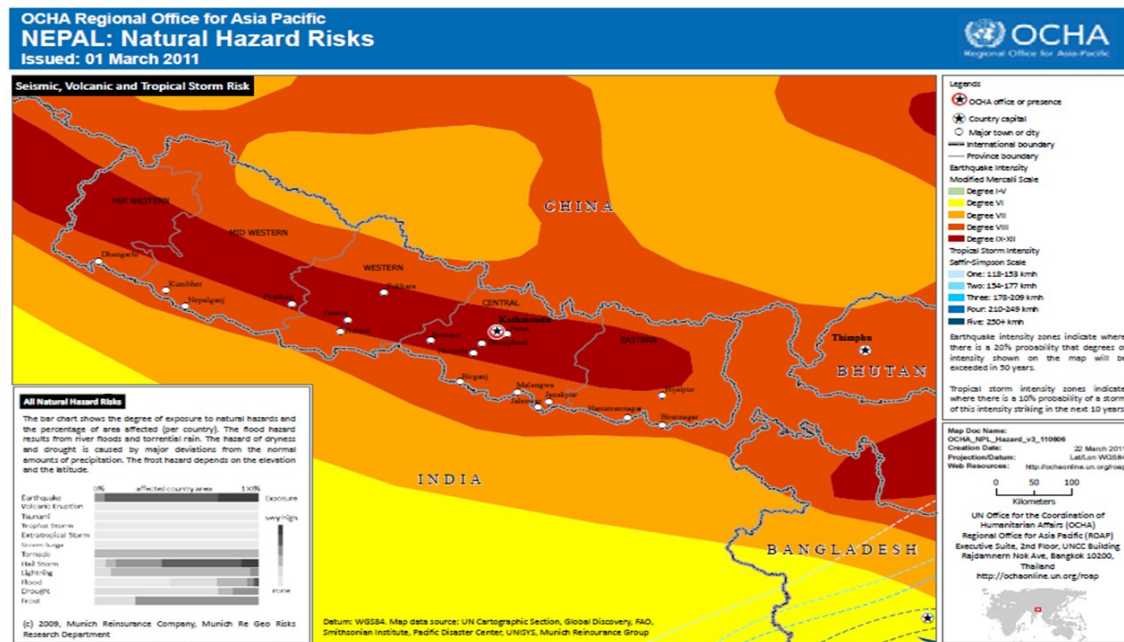


Figure 1. Natural Hazard Risk of Nepal

Source: Center for Excellence in Disaster Management and Humanitarian Assistance, Nepal Disaster Management Reference Handbook (Honolulu, HI: PACOM, 2015), 27.

The earthquake in 2015 was disastrous, and the GoN requested the international support to augment the inadequate national response. The earthquake was the biggest in Nepal in more than 70 years. Moreover, series of aftershocks, of which 423 aftershocks were of more than 4.0 magnitude, caused further damages. The most catastrophic aftershock was of 6.8 magnitudes that struck after 17 days (May 12, 2015) of the main earthquake (KC 2016, 3). The earthquake and its aftershock resulted into 8,979 death, 199 missing, 22,302 injuries, and destruction of 602,592 households (Ministry of Home Affairs 2015). There was significant damage to various infrastructures as well. The GoN projected that the earthquake affected approximately one-third of the Nepalese population, and it resulted in the loss of more than 700 billion Nepalese Rupees i.e.

approximately \$ 6.66 billion (KC 2016, 12). The Earthquake affected 31 out of 75 districts of Nepal (National Planning Commission 2015, 5). Figure 2 shows the severity of the earthquake in those 31 affected districts.

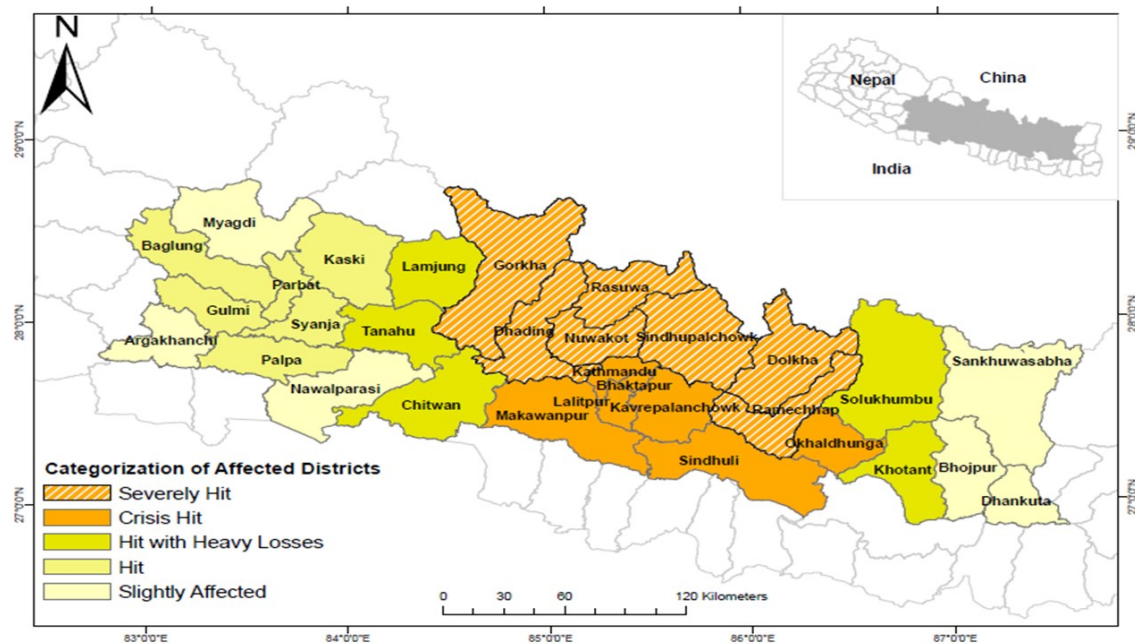


Figure 2. Categories of earthquake-affected districts

Source: National Planning Commission, *Nepal Earthquake 2015, Post Disaster Needs Assessment* (Kathmandu: NPC, 2015), 5, Accessed 27 December 2016.
https://www.nepalhousingreconstruction.org/sites/nuh/files/2016-04/PDNA_Executive_Summary_rev0730.pdf

Oslo guidelines, International Search and Rescue Advisory Group (INSARAG) guidelines and MNF Standing Operating Procedures (SOPs) are some of the important guidelines that set international standard and understanding regarding the use of civil defense assets and Urban Search and Rescue (USAR). Oslo guidelines cover the mobilization of multinational military and civil defense assets in times of disaster

(Nepalese Army 2015, 26). Likewise, INSARAG promotes internationally agreed coordination structures managed and advocated by OCHA, fosters coordination of preparedness and capacity building activities and, throughout an operation, assists countries in coordinating the emergency response (Schmidt 2015, 14). The MNF-SOP initiated the concept of MNMCC after the Indian Ocean Tsunami in 2004 AD. It was developed to enhance military collaboration in the Asia-Pacific region. It is a nonbinding collectively developed set of military procedures built on informal relationships and is annually reviewed and tested. The MNMCC is designed for information sharing and gathering to support disaster-response efforts. The MNMCC also coordinates with the national command element (Weilant 2016, 27).

Nepal did not have adequate resources to handle such a large-scale crisis. After initial analysis of the intensity and impact of the earthquake, the GoN immediately declared a state of emergency and deployed its resources including the Nepalese Army (NA). Following the declaration of emergency, the GoN formally requested for international assistance in the form of Search and Rescue (SAR), air transportation assets, medical teams, supplies including tents and heavy equipment for rubble clearing.

Large-scale disasters go beyond the capacity of one single organization, and the operation is shared by diverse actors who may have to work together yet have rarely met in the past or not at all (Cook, Shrestha, and Htet 2016, 14). In the case of Nepal, multiple government and non-government organizations were involved. Throughout the process, the GoN was in constant coordination with various stakeholders; it activated the NDRF and was prepared to receive international assistance. The GoN had continuously coordinated with different agencies including the line ministries, security agencies, and

U.N. Resident Coordinator (UNRC). According to the NDRF of Nepal, the Ministry of Home Affairs (MoHA) takes the lead in disaster response by establishing the National Emergency Operation Center (NEOC). The NEOC is responsible for coordinating the international military efforts through the MNMCC set up by NA. The non-military resources are organized by the On-Site Operations Coordination Center (OSOCC) established by OCHA. The MNMCC played a pivotal role in the operation by coordinating the national and international military efforts (Nepalese Army 2015). Likewise, the NEOC coordinated the non-military international and non-governmental efforts through the United Nations On-Site Operations Coordination Centers (OSOCC).

To deal with the crisis, the NA immediately launched operation SANKATMOCHAN (Means “removal of the problem”) and established the MNMCC. Thirty-four nations sent seventy-five teams (Eighteen military teams and fifty-seven non-military teams) to support the disaster response and relief effort in Nepal (Nepalese Army 2016). When the international rescue teams (including military) arrived in Nepal, the NA had established the MNMCC ready to receive the international support (Nepalese Army 2016). Out of those eighteen Multi-National Forces (MNFs) teams, six teams arrived within twenty-four hours, three teams came within seventy-two hours, and nine teams arrived after seventy-two hours. A total number of assisting forces was 4,175. See table 1 for the details of the MNFs teams’ arrival. Figure 3 shows the details regarding various types of support rendered by the MNFs. Similarly, Chart 1 shows the achievements of the MNF teams. The contribution of the MNFs is described in Appendix A, and detail of MNF’s participation in Appendix B.

Table 1. Details of the MNFs teams responding to the earthquake in Nepal		
Within 48 Hours	Within 72 Hours	After 72 Hours
India	Poland	Israel
China	Japan	Singapore
Pakistan	Malaysia	Thailand
Sri Lanka		USA
Bhutan		UK
Bangladesh		Canada
		Algeria
		Indonesia
		Spain

Source: Sangeet Pun, “Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt” (Thesis, Army Command and Staff College, Kathmandu, Nepal, 2016), 29.



Figure 3. Types of supports rendered by MNFs

Source: Colonel Naresh Subba, “Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt” (Presentation for the Conference Jointly Organized by MOHA, UNDP, NASC. Kathmandu, Nepal, 2015), 16, accessed 2 September 2016, <http://dms.nasc.org.np/sites/default/files/documents/Col.NareshSubba.pdf>.

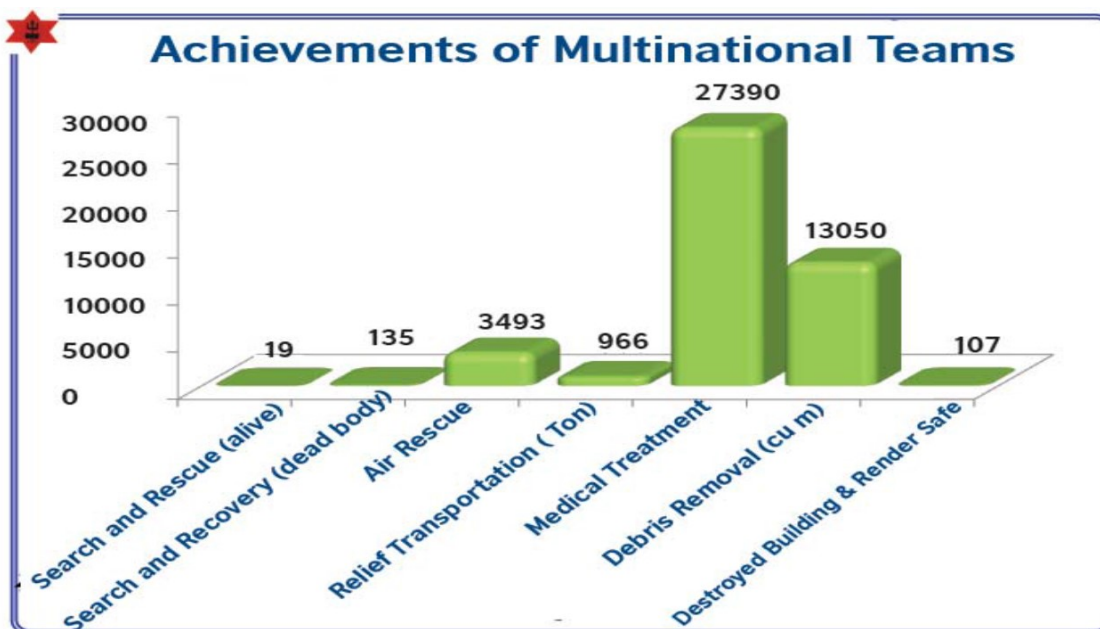


Figure 4. Achievements of the MNF teams.

Source: Nepalese Army, *Nepalese Army and Disaster Management* (Kathmandu: Nepalese Army, 2015), 28.

The MNMCC was responsible for coordinating the MNF elements. It faced numerous challenges regarding coordination. In addition to its role as coordinator of military efforts, the MNMCC initially coordinated the non-military international SAR efforts as well, until the establishment of the OSOCC. Throughout the operation, the MNMCC worked in close coordination with the OSOCC and the NEOC. The MNMCC organizational structure has four cells; Reception cell, Planning cell, Coordination cell, and the Liaison cell, as shown in figure 4. Reception cell is responsible for receive and conducts initial orientation briefing to the assisting military teams. Planning cell analyzes the input from the Liaison cell and the Coordination cell and makes disaster response plan (for next 24 hours and more) to include air operations, medical operations, rescue operations and engineering efforts. It was responsible for synchronizing the requirements and capabilities that it gathered from its coordination with the MNFs, NA, NEOC, and OSOCC. The Coordination cells bridge the MNMCC with the NA Directorate of the Military Operations (DMO), and with other stakeholders, specifically the NEOC and the OSOCC.

A separate liaison cell managed the liaison teams and Liaison Officers (LNOs), who were responsible for coordinating with the MNFs. The liaison cell had provisioned a minimum of one LNOs from the NA who were attached to each of the MNF teams to mobilize them in a systematic and coordinated manner (Nepalese Army 2015, 26). In addition to those four primary cells, the MNMCC has elements of the Psychological Operations (PSYOPS), and the Directorate of Public Relations (DPR) that coordinates with the NA's PSYOPS department and the DPR. However, it does not have any dedicated information management cells or elements. The daily update briefings,

attended by representatives from all the MNFs reinforced the coordination mechanism. A separate daily coordination meeting between the MNMCC, the OSOCC, and the DMO made the operation deployment more efficient. Thus, the MNMCC's role was vital in coordinating various resources and stakeholders.

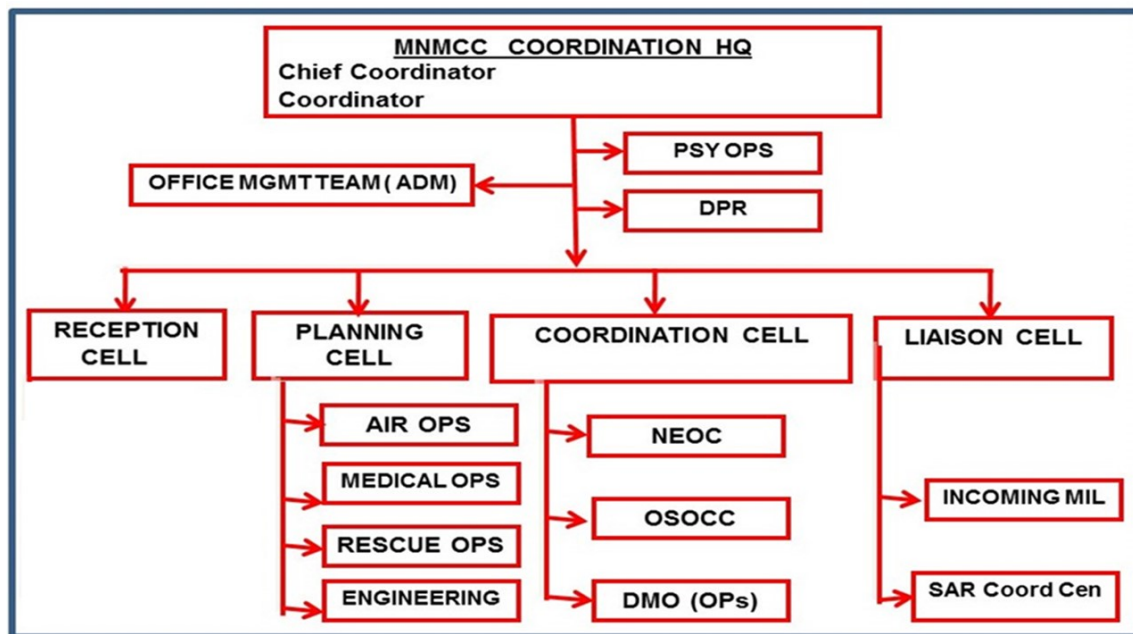


Figure 5. Organizational Structure of the MNMCC.

Source: Sangeet Pun, “Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt” (Thesis, Army Command and Staff College, Kathmandu, Nepal, 2016), 28.

The overall tasks of the MNMCC were as follows: (1) coordinate need assessments through the NEOC in coordination with other governmental and humanitarian aid agencies. (2) coordinate with the incoming militaries for assistance required to support the response effort as per the decision and priority of response operation that is decided in the NEOC depending on the capabilities of the incoming

military forces. (3) prioritize military efforts in support of the GoN's requirements/priorities in coordination with incoming MNFs. (4) establish liaison with concerned governmental agencies/humanitarian aid community and other parties as deemed necessary. (5) develop appropriate transition/engagement/ disengagement criteria and a transition plan for multi-national military support as per the decision of the GoN. (6) liaise with concerned authorities in relation with the clearance of MN air assets in Nepal. (7) avoid duplication of assets and capabilities (Pun 2016, 27-28). Figure 5 shows how the MNMCC was one of the key stakeholders and the focal point in overall coordination and functioning of NDRF for large-scale disaster responses in Nepal.

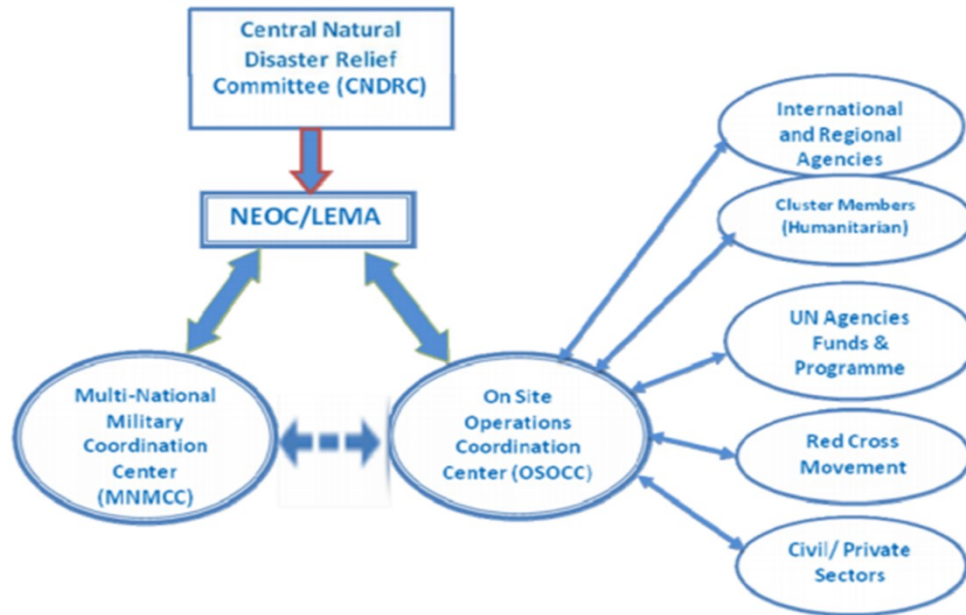


Figure 6. National Disaster Response Framework, Nepal.

Source: Colonel Naresh Subba, “Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt” (Presentation for the Conference Jointly Organized by MOHA, UNDP, NASC. Kathmandu, Nepal, 2015), 6, accessed 2 September 2016, <http://dms.nasc.org.np/sites/default/files/documents/Col.NareshSubba.pdf>.

In spite of functioning according to the NDRF and other guidelines, there are areas where the NA and specifically the MNMCC needs improvement to improve future disaster responses. Most of all, the fact that Nepal is prone to similar or even greater disaster signifies that emergency response mechanism should be further enhanced. Particularly, the improved coordination in part of MNMCC can result in the more efficient use of national and international military resources. During their response, the MNMCC encountered some issues such as duplications, lack of oversight, and unbalanced distribution of resources. Likewise, some resources used in operation could have yielded a better synchronized and timely response. This research focuses on the

coordination mechanism of the MNMCC. It endeavors to improve the coordination effectiveness of the MNMCC for future responses.

The 2015 earthquake was a large scale disaster for Nepal. The GoN implemented its NDRF to respond effectively. The NDRF mobilized the national resources and coordinated international efforts by activating NEOC, OSSOC, and MNMCC. Despite the pivotal role of the MNMCC, there is room for improvement in coordination procedures and processes of the MNMCC. This research seeks to identify and determine areas of improvement in coordinating military resources during disaster response and relief efforts.

Problem Statement

During the first seventy-two hours of the crisis, and specifically before the activation of UNOSOCC, the MNMCC established by the NA was able to coordinate not only the military but even the non-military international assistance. In general, the MNMCC of Nepal was found to be effective; however, there still exists challenges regarding coordination. In addition to improvement in coordination within the structure of MNMCC, better coordination of MNMCC with NEOC and UNOSOCC is necessary. It seems essential to recognize the changes required in the coordination of the MNMCC so that the NA can coordinate efforts of MNFs more efficiently during future disasters.

Research Question

This research paper will endeavor to answer the primary question: What changes could the GoN make in disaster response processes and procedures to enable the MNMCC to better coordinate the military efforts during future responses? Likewise, the

following secondary questions will be answered to conduct a viable analysis and come to practical conclusions,

1. What were the challenges for effective coordination of the MNMCC?
2. What were the factors leading to challenges for effective coordination by the MNMCC?
3. What were the best practices in the functioning of the MNMCC that are to be retained for future operations?
4. What measures are required to improve the coordination of the MNMCC?

Assumptions

It is assumed that the MNMCC will continue to play a crucial role in future large-scale disasters. It is also assumed that the NA and the GoN can address most of the coordination challenges of the MNMCC.

Scope and Limitations

The study will identify the coordination challenges of the MNMCC and determine measures to improve coordination. Due to the time limitation and various commitments during the Command and General Staff Officers Course, limited literature will be reviewed. Similarly, the thesis, and specifically the identification of challenges will be based on the functioning of the MNMCC during the 2015 earthquake. The target audience for this research is primarily the NA and the GoN. The involvement of the researcher during the operation SANKATMOCHAN may have the possibility of some sorts of bias regarding preconceived ideas. It could affect the selection of literature

review. However, this paper has reviewed literature that concludes that the MNMCC performed well.

Delimitations

This research paper will collect data primarily from published secondary sources, thus has the possibility of bias due to different interests and viewpoints. This study will use Doctrine, Organization, Training, Materials, Leadership and Education, Personnel, Policies, and Facilities (DOTMLPF) tools of Capabilities Based Assessment (CBA), as the model to identify the challenges in coordination of MNMCC. However, due to the time constraints, this research will include Doctrine, Organization, Leadership, and Policy only. Similarly, regarding coordination of MNMCC, the research will focus mostly on coordination within the MNMCC and emphasize less on the coordination of MNMCC with the NEOC and the UNOSOCC. The literature review will be based largely on the data produced after 2005. The MNFs' responses were within four sectors; SAR, medical, air transportation and engineer support. However, this thesis will only focus on MNF SAR efforts during disaster response. In terms of time, research focuses on first three weeks after the earthquake. Finally, the review of literature related to other incidents of international Humanitarian Assistance (HA), such as the earthquake in Pakistan and Haiti, and the typhoon in the Philippines will be limited to the lessons learned to determine the best practices for the MNMCC and necessary recommendations to improve coordination efforts.

Significance of the study

Most of the literature regarding coordination during the 2015 earthquake is focused primarily on overall coordination and at the policy level. However, limited works is available related to the MNMCC. This research can be significant in providing coordination during Humanitarian Assistance (HA) from MNMCC perspective. While especially important for NA, this research can be substantial for the other militaries and scholars to learn the possible challenges and mitigation strategies. Furthermore, it may help the NA and GoN to improve their response mechanism during future disasters.

Definition of Terms

Cluster Approach: This is a method developed by United Nations OCHA to coordinate efforts of various humanitarian actors, specifically during the international responses to humanitarian emergencies (OCHA ROAP 2014, 23). It establishes the coordination between domestic clusters of host country government's ministries and international agencies in structuring the emergency response and drafting DRR. The 11 clusters are Health, Water, Sanitation and Hygiene, Shelter, Food Security, Logistics, Education, Protection, Telecommunication, Nutrition, Early Recovery Network, Camp Coordination and Camp Management (Wendelbo et al. 2016, 19).

HuMOCC. Humanitarian-Military Operations Coordination Center was a civil-military coordination of the UN Humanitarian Civil-Military Coordination (UN-CMCoord) to provide a predictable humanitarian-military police coordination platform. Complementary to the On-Site Operations and Coordination Center (OSOCC), the HuMOCC provided the physical space dedicated to facilitating the interface between humanitarian actors, national/foreign military actors, as well as the national police

present in the country. It was co-located with the MNMCC to promote the interface among humanitarian agencies, domestic and foreign militaries (Lamichhane 2016, 67).

The MNMCC has termed HuMOCC as the Joint Coordination Center (JCC).

LEMA. Local Emergency Management Authority is the authority ultimately responsible for the overall command, coordination, and management of the disaster response operation. LEMA can refer to national, regional or local authorities, or combinations thereof, which are collectively responsible for the disaster response operation (OCHA ROAP 2014, 21).

NEOC. National Emergency Operation Center is a coordination center established by the national government within the Central Natural Disaster Relief Committee (CNDRC), responsible for overall coordination of HA. The OSSOC and the MNMCC coordinate with the host nation through the NEOC.

OSOCC. On-Site Operations Coordination Centre is a coordinating center established by the UN Disaster Assessment and Coordination (UNDAC) team associated with the LEMA and as close to the disaster site as is safely possible. It provides a platform for interaction between international responders and LEMA. The primary purpose of the OSOCC is to assist LEMA with the coordination of international responders as well as establishing inter-cluster coordination processes (OCHA ROAP 2014, 21).

UNDAC. UN Disaster Assessment and Coordination is the team deployed by UN OCHA to sudden-onset emergencies when requested by an Affected State or the UN Resident Coordinator. Its role is to assist in the initial assessment of a disaster and coordinate the international disaster relief effort (OCHA ROAP 2014, 21).

UN-CMCoord. UN Humanitarian Civil-Military Coordination is the essential dialogue and interaction between humanitarian civilian and military actors in humanitarian emergencies that is necessary to protect and promote humanitarian principles, avoid competition, minimize inconsistency, and when appropriate pursue common goals. Basic strategies range from coexistence to cooperation. Coordination is a shared responsibility facilitated by liaison and basic training (OCHA ROAP 2014, 21).

VOSOCC. The VOSOCC is a web-based information portal and management tool designed to facilitate information exchange between responders and the Affected State after sudden-onset disasters (OCHA ROAP 2014, 21). Field Coordination Support Section of UN OCHA and part of GDACS managed Virtual On-Site Operations Coordination Centre (VOSOCC).

Summary and Conclusions

Various natural disasters frequently hit Nepal, and the earthquake that struck in 2015 was a large-scale disaster for the country. The GoN responded by declaring a state of emergency, and by seeking international assistance in addition to the mobilization of its available national resources. GoN's response was guided by the NDRF that activated the NEOC, OSOCC, and MNMCC. The MNMCC proved crucial in synchronizing the military efforts primarily and initially, it even coordinated the efforts of non-military rescue teams. The conduct of MNMCC was highly praised; however, there still is room for improvement in coordination of the MNMCC.

This research paper will endeavor to determine the changes that the GoN could make in disaster response process and procedure to enable MNMCC to better coordinate military response during future operations. This research paper assumes that the

MNMCC continues to function in the future large-scale disasters and that NA and the GoN can address most of the coordination challenges of MNMCC. The functioning of MNMCC during the 2015 earthquake in Nepal will be focused to identify coordination problems. The target audience for this research is primarily the NA and the GoN. The subsequent chapter will review existing literature to determine the gap in knowledge that defines the primary and secondary research questions.

CHAPTER 2

LITERATURE REVIEW

This chapter will review existing literature which is relevant to this question “What changes could the Government of Nepal (GoN) make in disaster response process and procedure to enable the MNMCC to better coordinate the military response during future responses?”

There is various literature relevant to the military in disaster response and earthquake of Nepal that struck central Nepal on 25 April 2015. This research aims to determine the changes that GoN could make in disaster response processes and procedures to enable MNMCC to coordinate the military response much better. This literature review provides an available literature on the primary and secondary research questions. This chapter focuses on five categories of literature that attempt to answer the secondary research questions of this thesis. The literature review helps to identify the gap to determine the way of enhancing the MNMCC’s coordination efficiency.

The reviewed literature includes various reports, academic journal articles and publications related to the earthquake of Nepal, coordination during disaster management, and processes and procedures regarding humanitarian assistance. Review of literature is divided into five categories, primarily based on the secondary research questions of this thesis. The literature review helps to identify the gap that the researcher can focus to determine the way of improving coordination of the MNMCC. The five categories for the literature review are: (1) First category focuses on determining the challenges for effective coordination of the MNMCC, (2) Second group concentrate on identifying factors leading to challenges for effective coordination of the MNMCC,

(3) Third category focuses on highlighting the best practices of the MNMCC in terms of coordination, (4) Fourth group focuses on detecting measures to improve the coordination of the MNMCC, and (5) finally the fifth category concentrates on the miscellaneous additional information related to the topic i.e. explaining the organization and functioning of the MNMCC, disaster response frameworks, and other information required to clarify the thesis.

This thesis is case study based research and utilizes Capability Based Analysis (CBA) approach to include Doctrine, Organization, Leadership, and Policy (DOLP). Thus, this chapter has reviewed the literature on those five categories by focusing on DOLP as illustrated in the figure below.

Literature	Doctrine	Organization	Leadership	Policy
	Challenges for Effective Coordination			
	Factors Leading to Challenges			
	Best Practices			
	Measures Required to Improve the Coordination			
	Additional Information			

Figure 7. Literature Organization

Source: Created by the author.

Challenges for Effective Coordination

This portion of a review of literature helps in determining the challenges for effective coordination of the MNMCC. It also helps in identifying the challenges faced by the MNMCC during the coordination with the NEOC and the OSOCC. The incidents leading to certain undesired consequences during an emergency are examined to identify problems and challenges. Determination of such challenges in coordination will help in understanding the areas to be addressed and facilitate in visualizing the changes that GoN requires to help in improving coordination of the MNMCC in future military response.

The research paper of the EIAS (2016), *Crisis Response to the Nepal Earthquake: lesson learned* by Wendelbo et al., highlights various coordination gaps amongst different stakeholders and identifies a broad range of coordination challenges during the major earthquake in Nepal. The research highlighted the chaos situation that occurred immediately after the earthquake in Nepal, regarding the gap of information on the actual state of the affected area. This lack of information and real data relating to the extent of damage, made international responders arrive unaware, as they entered the country without knowing where their assistance was most needed (Wendelbo et al. 2016, 9). Hence, the confusing situation with minimum information about the destruction demonstrates the coordination challenges regarding leadership and education. Likewise, the researchers further emphasize the incident where, in spite of the good intentions, relief sent by the Pakistan demonstrated a negligence error. Due to the lack of effective coordination, the Meal Ready to Eat (MRE) sent by the Pakistan contained beef, and beef is prohibited in Nepal which is the Hindu dominated country (Wendelbo et al. 2016, 24). This incident also demonstrates coordination challenge regarding leadership and

education. The paper also underlines the event regarding the Belgian “B-Fast” rescue team that arrived late and with the wrong equipment. The rescue team came after four days of the major earthquake with SAR equipment whereas, by then medical and other support were more in urgency (Wendelbo et al. 2016, 30-31). They arrived with forces that do not or no longer met the needs of the affected area. These incidents demonstrate the gap in coordination and challenge regarding doctrine, and leadership and education.

Similarly, the paper also highlights the event where a team of the NYC Medics’ waited for several days in Kathmandu, before a helicopter (MNMCC resources) was available to deploy them to the required area (Wendelbo et al. 2016, 30-31). Thus, the event demonstrates the coordination challenges in organization, and leadership and education. Likewise, Wendelbo et al. claim that “Nepalese customs officials performed their regular inspection routines to relief packages, which led to a piling up of resources at the Kathmandu airport” (2016, 46). The paper also highlights the duplication of efforts and overlooking at some other places. The research mentioned, “Different teams neglected some isolated areas to cover others with the additional distribution of goods and healthcare, unaware of the efforts already undertaken” (Wendelbo et al. 2016, 23). Coordination challenge regarding doctrine and leadership and education is clearly seen in this event.

Similarly, the researchers highlight that the lack of coordination among the arriving responders – particularly the early arrivals from India, Pakistan, and China exacerbated the bottlenecking of international responders in Tribhuvan International Airport. During the time of emergency response time is clearly of the essence, however, in this case, the quick response made coordination difficult. We propose to create a

standardized response mechanism, with norms for response coordination – led by trained local staff. Likewise, engagement of Media in a proper manner during the emergency situation is also of great importance. International media in Haiti, as well as Nepal, mainly focused on search and rescue, whereas the real needs were shelter, food, water and medication. In Nepal, only a few people were rescued from the rubble by international USAR teams, whereas the media reports gave a different story. In conclusion, this paper identified many coordination challenges focusing on general perspective focusing minimum in the coordination challenges from the MNMCC perspective.

The coordination challenges of MNMCC is more covered in the presentation of the Nepalese Army, “Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt” presented by Colonel Naresh Subba. It includes the numbers of coordination challenges of MNMCC during an emergency in Nepal. It explains about ill-equipped Search & Rescue (SAR) teams, incidents of late arrival (after 72 hours) of some of the SAR teams and at some places unsatisfactory cooperation among the SAR teams. Similarly, it also highlights on coordination challenges between the MNMCC and the OSSOC. The presentation also highlights the incident of the civilian SAR operating without coordination with MNFs, and in some places, duplication of efforts. Thus, the claims made by the Nepalese Army demonstrates the presence of coordination challenges.

Likewise, it also emphasized on coordination challenges between the MNMCC and the NEOC. Inaccessibility of the staff 24/7 in the cluster lead desks in NEOC in the aftermath of the earthquake made it slow in being operational. The presentation by

Colonel Subba claims that instead of having direct coordination with NEOC, the OSOCC mostly coordinated through the MNMCC. It also claimed that the establishment of “Command Centre for SAR Operation” at NEOC was not practical.

“Nepal Earthquake Exposes Gaps in Disaster Preparedness,” by Dinesh C. Sharma, published in the Lancet, 2015 reveals that even after days of the earthquake, rescue teams were not able to reach the affected areas such as Sindhupalchowk, Banepa, Sankhu, and Rasuwa, close to Kathmandu (Capital). Considering the magnitude of the earthquake that stroke Nepal, ccasualty figures in those areas could run into thousands, and much-needed rescue and relief were not available. The paper highlighted information regarding the damaged infrastructure and loss of life that occurred in those villages. For instance, it states that over 90 percent of homes had collapsed. However, this article seemed to have over generalized the fact. Sindhupalchowk, Banepa, Sankhu, and Rasuwa represents the districts, and it is unlikely that whole region had remained without any support for those many days. Nevertheless, in spite of being near to the capital, many pockets within those districts might have been overlooked. Thus, it signifies coordination challenge.

“Nepal Customs Holding up Earthquake Relief Efforts, Says United Nations,” by Rebecca Ratcliffe, 2015. The article highlighted that even in the aftermath of devastating earthquake, Nepal was following the peacetime custom methodology. The desperately needed materials were piling up at Kathmandu airport instead of being pushed out to victims. It highlighted the inadequacy of customs policy and procedures.

“Nepal Earthquake-Lessons Learned and the Way Forward,” by Steffen Schmidt, is the report published by OCHA in 2015. The report underlined that there was a massive

influx of USAR teams in Kathmandu Airport that had very limited capacity delayed the arrival of UNDAC. Whereas, the timely arrival of UNDAC was urgent for the establishment of the OSOCC. The report revealed that UNDAC was able to create the coordination cell for non-military USAR only on 27 April 2015 (two days after the earthquake). Delay in the establishment of UNDAC delayed the specialized assessments. Likewise, the report also disclosed that some SAR teams accepted to extricate deceased victims, while others did not. The failure to remove dead victim had direct consequences for health and environment, and sentimental value; the relatives of dead ones seeking a corpse to perform final rituals. Thus, the report highlighted the coordinating gap in airport management (including reception of USAR), arranging early arrival of much needed UNDAC team, and synchronizing the uniformity in USAR procedures i.e. not leaving behind the dead victims.

In the same report, Schmidt also highlighted that after 48 hours of the earthquake, GoN request to stand-down international USAR teams; however, 54 USAR teams arrived afterward, and they took up the only international airport's (Kathmandu) capacity restricting the immediate need of medical teams and supplies. The USAR teams that arrived within 48 hours of earthquake rescued 11 of the 16 live victims. Thus, there was a coordination challenge to enable inflow of right team in precise time.

An After Action Review (AAR), *The Nepalese Army in the Aftermath of the Gorkha Earthquake of 2015*, by the NA noted that most of the MNFs came prepared and resourced thus, were self-sustained. However, some of the MNF teams did not arrive self-sustained and burdened already overstretched NA for the rations and accommodations arrangement for them. It also noted that the NA and other stakeholders had failed to

select suitable sites in advance for such teams to establish camps. Thus, it reveals that there were coordination challenges, and effective coordination was required even before the arrival of the MNF teams.

Factors Leading to Challenges

This portion of the review of literature helps in determining the factors responsible for various coordination challenges of the MNMCC as mentioned earlier in the first part of the review of the literature. Identification of such factors leading to coordination challenges will be important in determining the required changes to enable the MNMCC to better coordinate military response during future responses. Similar to the determination of the coordination challenges, factors leading to challenges will be viewed from doctrinal, organizational, and leadership and education lenses.

“International Search and Rescue Advisory Group (INSARAG) Guidelines and Methodology” Office for the Coordination of Humanitarian Affairs, July 2006. The INSARAG guidelines outlined by United Nations Office for the Coordination of Humanitarian Affairs (OCHA), provides methodology regarding the use of international Urban Search and Rescue (USAR) in support of HA. It encourages all INSARAG members to adopt the INSARAG Guidelines as an integral part of their national disaster management framework. Nepal is a member of UNSARAG so, INSARAG guidelines has significant influence in disaster-related organizations in Nepal including the MNMCC. This article helps to compare between the INSARAG guidelines and the Search and Rescue (SAR) activities conducted by different militaries during post-earthquake in Nepal. The SAR teams not following the INSARAG guideline and the standard's hard to coordinate.

The Nepalese Army's presentation by Subba (2015, 24) helps in determining some factors contributing to coordination challenges of the MNMCC. The cluster lead desks in National Emergency Operation center (NEOC) were not continuously manned, so in the aftermath of the earthquake, it was slow in being operational. During the emergency response the OSOCC mostly coordinated through the MNMCC, instead of having direct coordination with NEOC. Similarly, the presentation claimed that the establishment of "Command Centre for SAR Operation" at NEOC was not practical. The presentation has displayed the NEOC as one of the reasons for making coordination difficult; however, the analysis in the presentation is only from NA's perception and does not resemble the difficulties from the perspectives of the NEOC.

The report, "Out of Barracks: Civil-Military Relations in Disaster Management: A Case Study of Nepalese Army's Humanitarian Response during 2015 Earthquake in Nepal," by Manish Thapa, 2016. The report shows the gap in two internationally recognized guidelines i.e. the Oslo Guidelines and the MCDA Guidelines. The instructions give adequate advice regarding the coordination and use of external military resources; however, it gives limited attention to guide relating to the role of the military assets of the host nation. It further highlights the national armies, particularly in developing countries, as the 'first resort' of governments in large-scale disasters (Thapa 2016, 5). Thus, inadequate information regarding the role of host nation militaries may increase, but not decreases the coordinating challenges.

The report by Steffen Schmidt (reference page 25) concludes that the affected state should simplify the custom and other administrative issues to facilitate speed and easy entry, transit, stay and exit of assisting military teams. The article highlights its

concern that prior earthquake, there had been agreements between the OCHA and the GoN to smooth customs clearance to facilitate international assistance, however, no improvement had been found. Likewise, once the GoN declared an emergency and requested the international aid, the Virtual On-Site Operations Coordination Centre (VOSOCC) had immediately posted that agreement and the actual requirements. Thus, the article shows the concern that despite such agreements and information, the custom clearance and immigration procedures in Nepal during the earthquake was time-consuming. Therefore, it indicates that GoN and its authorities were responsible for delay and difficulties faced by assisting teams in the Kathmandu Airport. The report does not only shows shortcomings of GoN, but also shows drawbacks of some of the assisting international teams. It suspects that insufficient or lack of proper paperwork beforehand and during the emergency could also be a contributing factor for such delay. The report of the OCHA ROAP also has similar observation that in addition to the host nation, the assisting teams too have a responsibility to meet the custom requirements. It highlights that even during disasters, every country has a right to apply custom rules and regulations required to maintain control. It emphasized that GoN has an agreement to ease or exempt custom obligations to facilitate assisting teams; but, full access cannot be given without a minimum control of documents regarding incoming goods and personnel.

Similarly, in the report, Schmidt has highlighted on various contributing factors for coordination challenges. He claims that the delay and gap in gaining assistance by the population of the particular area were also due to the denial of some of the assisting teams to go to operate in the designated sectors. Those teams seemed to have conflicting interest, as they are looking for more “profitable” sites themselves. Some of them were

targeting the area where they could have better exposure from the media. These were one of the contributing factors for duplication of effort. Likewise, the report disclosed that only 18 of the 76 responding international SAR teams were INSARAG classified and all teams did not have the capacity required for a USAR teams (Schmidt 2015, 4). As the majority of the responding teams were not members of INSARAG, they did not function according to INSARAG methodology and guidelines (Schmidt 2015, 13). Thus, ignorance of INSARAG guideline is one of the contributing challenges for coordination. Equally, another contributing factor for coordination challenge was the lack of internet connectivity. Deficiency of connectivity delayed the updates on the VOSOCC and the use of electronic forms and templates (Schmidt 2015, 5). The delay of updates on the VOSOCC deprived assisting team from the information that was required to prepare for providing necessary assistance.

Research paper, “Enhancing SAARC Disaster management: a comparative study with ASEAN coordinating center for humanitarian assistance on disaster management,” has highlighted that the lack of a pre-coordinated plan or resource management amongst stakeholders resulted in friction during emergency response (Lamichhane 2016, v). It further emphasizes the situation in remote areas where the road, the main transportation route, had damages. The population of this area suffered even more as helicopters were the only mode of transporting relief materials for them, and at that moment the helicopter was a scarce resource. It has also highlighted that in spite of the importance of immediate support from militaries of countries in the region i.e. South Asian Association for Regional Corporation (SAARC) countries, there was a lack of disaster management coordination within the region. For instance, SAARC has established the SAARC Centre

for Disaster Management and Preparedness (SDMC) in New Delhi; however, it has failed to set up a dedicated SAARC Disaster Management Rapid Action Force (SDMRAF) (Lamichhane 2016, 33). The issue of regional approaches to disaster management is not taken seriously in SAARC (Lamichhane 2016, 55). Lack of such prior coordination and lack of establishment of joint effort such as SDMRAF increases the coordination challenges even amongst the MNF within the region.

Report, Humanitarian Assistance and Disaster Relief mission by a tripartite medical team led by the Singapore Armed Forces after the 2015 Nepal earthquake, published by Nanyang Technological University. The report reveals that Singapore medical team faced difficulties to deliver medical care to victims in villages because they did not have the necessary transportation assets or equipment to pass through the deep mountain terrain (Ho et al. 2016, 430). Likewise, they faced challenge also because of their inability to communicate in Nepali language (Ho et al. 2016, 430). Thus, the team arrived in Nepal but could not contribute much due to lack of their familiarity and failure to do prior coordination.

The report release, “III MEF releases results of Nepal UH-1Y aircraft mishap command investigation” revealed that the UH-1Y Huey mishap that occurred in Nepal during Joint Task Force 505’s humanitarian assistance and disaster relief efforts were a result of lack of terrain familiarization and unstable meteorological conditions(III MEF Public Affairs Office 2015). The report claims that the accident led to the death of all on board, including two Nepalese Army Liaison soldiers. This investigation report shows that prior knowledge and better familiarity of the area of operation is necessary during operations.

The NA AAR (2015,26) emphasized that due to the difficulty in effective information management, initial damage assessment and the identification of requirement was difficult. The software used in the NEOC for collecting information from the affected Districts was not very efficient, and it caused into the ineffective mobilization of resources, thus complicating the relief distribution procedure. (Nepalese Army 2015, 42). Hence, lack of accurate information is one of the factors leading to coordinating challenge. Likewise, the NA AAR also informed that the Nepalese National Disaster Response Framework (NDRF) envisions the OSOCC to coordinate the effort of non-military SAR teams. However, delay in the establishment of the OSOCC increased the coordination challenge (Nepalese Army 2015, 42-43).

Similarly, the NDRF mandates the authorities of the Ministry of Home Affairs (MoHA) to oversee and coordinate overall rescue and relief efforts. The NEOC under the MoHA is the coordination center to coordinate overall effort. The AAR highlights that the mobilization of all the security agencies of Nepal including the Nepalese Army was in immediate effect after the 25 April mega earthquake, nevertheless, there was an absence of a higher civilian's active entity to coordinate the efforts of all the concerned sectors (Nepalese Army 2015, 41). Thus, it was difficult to achieve an effective coordination among various relevant sectors which affected the collection and the distribution mechanism of the relief material.

The research paper of the EIAS (Wendelbo 2016, 22) identified various factors that lead to increasing challenge in coordination during disaster response in the earthquake of Nepal. The research has identified exaggeration by media, varied interests, unhealthy competition among assisting nations, ignorance of host country request, lack of

need assessment, and lack of situational understanding as some of the key reasons for challenges in coordination. However, the article has less focus on identifying causes leading for coordinating challenges of the MNMCC.

In a newsletter of the OCHA, *Humanitarian Civil-Military Coordination Issue No.5*, by the CMCoord, 2015 describes how the UNOSOCC and the MNMCC coordinated during the earthquake of Nepal, by establishing Humanitarian-Military Operations Coordination Centre (HuMOCC) close to the MNMCC (OCHA 2015). During initial days, there were difficulties in coordination between the MNMCC and the OSOCC. Thus, the HuMOCC was co-located with the MNMCC without any doctrinal provision or procedure. However, this Ad-hoc arrangement was not as per the design, but impromptu. Thus, lack of adequate doctrinal provision is also reason for these coordination challenges.

Collaborative Disaster Preparedness by Sarah Weiland, published by the RAND Corporation, 2016 is a collection of reports and work during the workshop conducted in Vietnam, 2015. The paper informs that BGen. Paul Kennedy, Deputy Commanding General, III Marine Expeditionary Force in Okinawa noted that information sharing during a response is one of the biggest challenges during disaster responses. He highlighted that the U.S. military typically operates on classified channels that prevent other militaries from sharing information with no trouble (Weiland 2016, 19). Thus, lack of compatible communication means and procedures, and the security interests also leads to the challenges in coordination. In Nepal, Joint Task Force 505 of U.S. PACOM had assisted, and such difficulties for information sharing could have existed there as well.

The report, “IPS officer O P Singh appointed new Director General of NDRF” by Indiatimes, 2014, and the report, *Nepal Earthquake*, by NDRF reveal that the National Disaster Response Force of India that assisted during disaster response in Nepal was not the Military Force but the non-military assets (NDRF-India 2015). Those forces were not the military and were not under the defense ministry, but they are the paramilitary under the home ministry of India (Indiatimes 2014).

The MNMCC coordinates the international military effort, whereas, during the earthquake in Nepal the MNMCC had a technical challenge to coordinate the armed forces under the provision of the non-military organizations such as the Disaster Response Force of India and SAR teams of USAID. The journal, *Lessons from Nepal and Other Recent Disasters* by Katryn McCalment, 2016 informs that the U.S. Foreign, Assistance Act of 1960 (with subsequent edits) informs that the lead agency during any U.S. government foreign disaster response is USAID with the Office of Foreign Disaster Assistance as the operative (Aaron, Wooldridge, and Sholler 2016, 28). The Journal also identified the limitation in cargo handling capacity, inadequate parking space, and lack of updated information on the situation in various region of Nepal increased the coordination challenges. Despite no significant damages to the airport, limitation in the airport facilities created difficulties in coordinating the processing, storage, supply and distribution of the relief materials (Aaron, Wooldridge, and Sholler 2016, 16). Likewise, the failure to update the Logistics Capacity Assessment (LCA) for several years restricted the ability to gain logistics information in the first days of the response (Aaron, Wooldridge, and Sholler 2016, 41).

Emerging Challenges to Civil-Military Coordination in Disaster Response, by Jund and Sholler, Journal Article of the Civil-Military Disaster Management and Humanitarian Relief Collaborations (Center for Excellence in Disaster Management and Humanitarian Assistance), 2015. The Journal reveals that, despite the vital importance of air assets, two Chinook helicopters of the United Kingdom ready to be flown in from nearby India were not given clearance either to leave India or to enter Nepal. Likewise, the Indian government had restrictions even on flights carrying relief items, which had no option but to use Indian airspace (Jund and Sholler 2015, 17). The issues mentioned earlier shows the lack of prior agreements with the neighboring government and this in return created coordination challenges during execution.

Best Practices

This portion of the review of literature helps in identifying the best practices of the MNMCC during the disaster response after the earthquake of Nepal 2015 AD. Retaining of such best practices will be vital in avoiding the unnecessary changes in emergency response process and procedure to enable the MNMCC to better coordinate military responses. The literature focused on information related to the earthquake in Pakistan and the crisis response in the Philippines.

The research paper of the EIAS (2016, 22) presented a contrast regarding disaster response preparedness of Nepal and Pakistan. It had highlighted how the implementation of an emergency response framework by Nepal proved operative in compassion to Pakistan when it responded to an earthquake in 2005 AD. Here again, the article has been less concerned about finding the reasons leading to coordinating challenges of the MNMCC.

The OCHA report by Schmidt (2015, 25) appraises that years before the earthquake, Nepal had been participating in various disaster-related conferences and exercises. Nepal hosted the INSARAG Regional Exercise in 2009 and the regional meeting in 2012. The participation and knowledge shared during the conference well contributed the national staffs and had very concrete implementation during the actual response (Schmidt 2015, 11). Thus, a continuation of such exercise is essential.

The Paper by Weilant (2016, 33) focus on the importance of establishing the MNMCC according to the Multinational Force Standing Operating Procedures (MNF-SOP) that was created after the 2004 Indian Ocean tsunami to enhance military collaboration (Weilant 2016, 18). This document presents a contrast between the effectiveness of the MNMCC in the Philippines during Typhoon Haiyan response and the effectiveness of the MNMCC established during the earthquake of Nepal, 2015 AD. It suggests that sooner the establishment of MNMCC is better for coordination during disaster response.

On the other hand, the report, *Advances in Civil-Military Coordination in Catastrophes*, by CFE-DM, 2015 highlights that in comparison to the Haiyan, the Philippine government acted well in responding to the Super Typhoon Hagupit, 2014. The Typhoon Haiyan (2013) and Typhoon Hagupit (2014) hit the Philippines in a year difference; both typhoons swept across the same general area and had similar intensity. Typhoon Haiyan's maximum sustained wind reached approximately 170 knots, while Typhoon Hagupit's reached about 155 knots. However, there was a great difference regarding devastation of those two typhoons. Individuals affected during Typhoon Hagupit was four times lesser than that of Typhoon Haiyan, and only 18 lost lives during

Typhoon Hagupit, whereas death toll from Typhoon Hayain was 6,300. It validates that the Philippines' preventive measures taken during the period of a year between those two typhoons made some difference (CFE-DM 2015, 8-9).

However, the establishment of the Multi-Nation Coordination Center (MNCC) during Typhoon Hagupit was on time in comparison to the Typhoon Hayain. Likewise, the Philippine government had prior bilateral agreements with potential responders thus, receiving timely assistance from the regional ASEAN entities (CFE-DM 2015, 14-16). Hence, the GoN needs to implement the practice of the Philippine government to have prior bilateral agreements.

ProQuest. "Report Information from ProQuest." Bangkok: Thai News Service Group, 2016. This article highlights the preparation of the Armed Forces of Philippine (AFP) to response the future disaster. The government of Philippine conducted three days of humanitarian assistance, and disaster response exercise to train forces to deal with these emergencies. Likewise, a newspaper report Information from ProQuest, published by HT Media Ltd, Kathmandu, August 25, 2016, highlighted that the establishment of the MNMCC was useful in coordinating MNF support that was beneficial in rescuing many lives.

The research paper by Lamichhane (2016, 30) compared the ASEAN with the SAARC and emphasized that the countries within the same region should have frequent interactions to enhance the interoperability. ASEAN has conducted various disaster-related exercises in the area including the ASEAN countries and other partners such as the United States, China, Japan, India, and Australia (Lamichhane 2016, 64). Likewise, the ASEAN has agreed to have the Militaries Ready Group that can deploy as early as

possible, as a first responder (Lamichhane 2016, 63-64). Comparatively, The SAARC does not have such dedicated exercises and agreements. It would be a good practice if Nepal can push the SAARC to take initiatives similar to the ASEAN. However, issues regarding the government of India and the government of Pakistan has always been a significant factor in the decision-making process in the SAARC

A journal by McCalment (2016, 34) shows the contrast between the Nepal and the Philippine concerning availability of accessibility to assisting response teams. Nepal was restricted to a single military-grade runway and required dozen overflight requirements with other countries. However, the Philippines had the benefit of several airfields and approach by the sea from any direction (McCalment 2016, 28). It shows that it is good practice to have multiple accessibilities and prior coordinations and agreements in using airspace during a natural disaster.

The report, *Two Decades of Earthquake Risk Management Actions Judged Against Gorkha Earthquake of Nepal* April, published by NSET, 2015. The report emphasizes that pre-disaster preparedness of Nepal in some extent saved lives and resources in the earthquake, and facilitated coordination during disaster response and relief activities. The report highlighted that the Program for Enhancement of Emergency Response (PEER), helped to increase the effectiveness of the Nepalese Armed Forces during disaster response (Dixit, Guragain, and Shrestha 2015, 8). The report exhibited that the peacetime preparation amongst national armed forces increased interoperability amongst the various stakeholders during disaster response. Thus, prior preparedness enhances coordination.

The report, “Enhancing the U.S. and International Civil-Military Preparedness for DM,” published by the ACE Program, 2016. The report highlighted the good initiative taken by the NA in establishing MNMCC and quickly taking its responsibility as there was a delay in the establishment of civilian supervising authority. Due to the delay in functioning of the civilian authorities of the GoN, the foreign militaries directly coordinated with the NA through the MNMCC, in contrast to the international mechanism. Thus, it may be necessary to adjust the international mechanism to change according to the situation in the affected states (Awwal et al. 2016, 18). Therefore, the NA established the real legacy of taking the initiative and adjusting international mechanism according to the situational requirement.

The Journal, “Nepal Earthquake: Enhancing International Humanitarian Cooperation,” published by the S. Rajaratnam School of International Studies, 2015. The article compares SAARC with ASEAN and recommends SAARC to have a more responsible role towards disaster related issues in the region. The South Asia is prone to various natural disaster. However, SAARC is very inactive in humanitarian assistance and disaster relief initiatives (Anthony, Cook, and Trajano 2015, 2). The article recommends SAARC to draw on valuable lessons from ASEAN, to establish a regional disaster mechanism that can complement international relief assistance and facilitates coordination between military and civilian agencies (Anthony, Cook, and Trajano 2015, 2).

The report, “Out of Barracks,” by Manish Thapa, 2016 highlighted the benefit of innovating a cell to coordinate between the MNMCC and the OSOCC in Nepal. During the earthquake in Nepal, the UNOSOCC established Humanitarian-Military Operations

Coordination Centre (HuMOCC) which was termed as Joint Coordination Center (JCC) by the MNMCC (OCHA 2015). However, the establishment of JCC was on the request of World Food Program (WFP) and this initiative was taken by MNMCC (Thapa 2016, 11). The establishment of the HuMOCC/JCC also facilitated in documenting and reacting to the requests for assistance (RFA) and requests for information (RFI). It facilitated information sharing, and synchronization of the military and non-military efforts in the response operation (Thapa 2016, 10). Thus, the stakeholders during earthquake response in Nepal established a new initiative by creating JCC, which is the MNMCC term for restructured HuMOCC.

Measures Required to Improve the Coordination

This portion of the review of literature focuses on highlighting recommendations regarding the necessary changes to enable the MNMCC to better coordinate military response during future responses. Similar to the determination of the coordination challenges, the recommendation will also consider doctrinal, organizational, and leadership and education lenses. Additionally, recommendations will also be viewed from the target to be recommended i.e. the Nepalese Army, the GoN, and others.

The report of the NSET (2008, 38) gives a brief account of how the Program for Enhancement of Emergency Response (PEER), assisted in enhancing the effectiveness of the Nepalese Armed Forces during disaster response. Likewise, National Society for Earthquake Technology, Nepal, in the report, “National Strategy for Disaster Risk Management in Nepal,” 2013 equally emphasizes on effective pre-disaster preparedness. The document on National Strategy for Disaster Risk Management in Nepal guide, encourage and ensure development and implementation of coordinated approaches to

manage and minimize the greater disaster risks and adequate preparedness at all levels (National Society for Earthquake Technology, Nepal 2008). The document contributes this thesis by identifying an area of focus for MNMCC regarding things to be coordinated or prepared in advance. Thus, the literature reviewed earlier suggest that the peacetime preparation amongst national armed forces increases interoperability amongst the various stakeholders during disaster response.

The presentation by Subba (2015, 24) highlighted few MNMCC's recommendations for better responses in future calamities. The presentation recommends the SAR teams to be self-contained and recommended to have SAR efforts to be under one channel for smooth coordination (Subba 2015). Similarly, it suggests for carrying out prior rehearsals according to the mechanism of the NDRF to acquaint all actors of their responsibilities. During the major natural calamities, the first responder would be the Regional partners. Thus, a regional disaster response framework is an essential mechanism. Hence, the effectiveness of the SAARC Disaster Management Centre is of the primary importance. The National Disaster Response Framework should have an explicit provision; should the Nepalese Army be given a lead role in certain tasks until the responsible Governmental Agency is prepared to take the lead. The clear rule should be formulated, which explains the coordination of SAR operations by MNMCC until the OSOCC is fully functional. Similarly, the arrangement of Memorandum of Understanding - MOU, and Status of Forces Agreement – SOFA should be coordinated well in advance, with identified countries, which will expedite the assistance process. Likewise, several initiatives should be taken to enhance the effectiveness of reception

desk at the Airport and the Airport management which is crucial in the efficacy of the disaster response.

A report, “Asia-Pacific Regional Guidelines for the Use of Foreign Military Assets in Natural Disaster Response Operations” compiled by the OCHA ROAP. The report recommends that foreign military assets should be self-sustaining during the disaster response and relief operations. They should avoid putting the additional burden on the host nation authorities and resources or another stakeholder in the affected area. Likewise, the report also recommends that the assisting States’ military forces should consider the cultural and religious sensitivities of the affected population (OCHA ROAP 2014, 12).

The report of the Multinational Planning Augmentation Team, *MNF SOP Humanitarian Assistance Disaster Relief (HA/DR) Extract*, 2010. The report recommends that each potential assisting country should develop an initial checklist according to their capabilities. They should inform regarding the most likely support they can offer as a foreign disaster assistance. The assisting states can include this country-specific checklist as a part of their international disaster support SOP (Multinational Planning Augmentation Team 2010, 33).

The report, *Humanitarian Civil-Military Coordination for Asia and Pacific*, by Regional Consultative Group, 2015. The report recommends various measures as a prior coordination (pre-disaster) amongst the likely host nation and the potential assisting countries. It emphasizes on having a need assessment by specific national contexts. It highlights that the identification of available foreign military assistance should be managed in the preparedness phase. Furthermore, there should be pre-determined

agreements with particular government/armies regarding the assets that assisting nation can immediately mobilize. Likewise, the report also recommends having an interoperable monitoring system to track the use and allocation of military assistance (Regional Consulative Group 2015, 3).

A journal by McCalment (2016 34) recommends having enhanced military command center to cater for contingencies. It highlighted that delay in the establishment of the OSOCC resulted in confusion amongst the nonmilitary teams. However, the initiative was taken by the MNMCC to eliminate confusion and smoothen the process of disaster response and coordination. Therefore, the article envisioned the need for an enhanced military command center (Aaron, Wooldridge, and Sholler 2016, 17).

The OCHA report by Schmidt (2015, 25) recommended to have better information management and suggests the further active participation of the INSARAG Regional Groups. It mentioned that the availability of systematized and structured information helps in providing the actual need, and avoid unnecessary involvement. (Schmidt 2015, 9-10). Likewise, INSARAG Regional Groups should be more active to enable USAR teams to have a better understanding of the INSARAG system and tools (Schmidt 2015, 13). Similarly, the report also recommends that instead of having the military function under the MoHA, it is effective to establish disaster management council under the chairmanship of the prime minister (Nepalese Army 2015, 45). Likewise, it also emphasized on the need to formalize the JCC to facilitate tactical level coordination mechanism between MNMCC and OSOCC (Nepalese Army 2015, 51).

The Paper by Weilant (2016, 33) informs that Brigader General Kennedy recommended having multilateral training exercises to overcome the problem of the

variation in procedures between the militaries. He highlighted that the U.S. military typically operates on classified channels that prevent other militaries from sharing information effortlessly (Weilant 2016, 19). Thus, the conduct of the multi-lateral training exercises can overcome the lack of compatible communication means and methods.

The NA AAR (2015, 26) has provided on brief overview regarding how the NA, specifically the MNMCC performed during the operation SANKATMOCHAN. It highlights the areas of improvement for the NA to overcome future challenges more efficiently. However, the recommendations were focused less towards the MNMCC. Related to the MNMCC, it has concentrated on the importance of continuing with various conferences and joint exercises to improve interoperability and coordination during future disasters. The AAR also highlighted the need for a higher civilian body to act promptly and efficiently to facilitate coordination from the very beginning. It noted that despite mobilization of all the security agencies, immediately after the major earthquake, there was an absence of a higher civilian active body, to coordinate the efforts of all the concerned sectors. It created difficulties in having effective coordination among various related sectors, and in collection and distribution mechanism. The need for a competent body to assume the leading role in coordinating the efforts of all the areas involved in in the field is necessary (Nepalese Army 2015, 41).

The AAR also informs regarding the provisions in the Interim Constitution of Nepal 2006, and the New Constitution of Nepal 2015, relating to the mobilization of NA during a disaster. During the mega earthquake of April 2015, the Interim Constitution of Nepal 2006 was in force. The constitution had provisions that made it possible to

mobilize the Nepalese Army for disaster management without prior authorization of the Parliament (Nepalese Army 2015). The constitution approves that the Government of Nepal may, by Federal law, mobilize Nepalese Army for works relating to development, disaster management and others (Constitution of Nepal 2015, Article 267, and Clause 4). The New Constitution also has provision for early deployment of the NA for disaster management; however, Nepal is still in process to develop federal laws and regulations, and those federal laws and regulations have to consider appropriate modalities of deploying the NA during disasters.

Additional Information

The reviewed literature provides adequate information regarding the coordinating challenges during the earthquake in Nepal.

“National Disaster Response Framework.” Kathmandu: The Government of Nepal, Ministry of Home Affairs, July 2013. This framework outlines the roles and responsibilities of various HA stakeholders including the MNMCC that is as per the actual conduct during disaster response in Nepal 2015.

The presentation by Subba (2015, 24) covers a broad range of information regarding the operation SANKATMOCHAN and the MNMCC to include the organization of the MNMCC and the details of international militaries assisting Nepal. It includes a chart showing the National Disaster Response Framework (NDRF) of Nepal and illustrates how the MNMCC coordinates with the NEOC and the OSOCC. It provides data regarding the participating Multi-National Forces (MNF), and types of support to include Search and Rescue (SAR), medical, epidemic control, water purification, engineer, transportation (including air), road clearance, debris management, and

stabilization. It has an excellent collection of pictures demonstrating the involvement of MNFs and the functioning of the MNMCC. Similarly, the paper, “Nepal Earthquake 2015: Role of Nepalese Army” by Sangeet Pun (2016), informs the overall tasks of the MNMCC during the earthquake.

The paper, *Nepal Disaster Management Reference Handbook*, published by the PACOM Center for Excellence in Disaster Management and Humanitarian Assistance, 2015. The paper appraises of the vulnerability of Nepal regarding various disasters. It also has a map that displays the natural hazard risk of Nepal. Similarly, the Paper, *Capacity Assessment for Nepal --Urban Search and Rescue, Sustainable Training and Resilient Disaster Management*, published by the United Nations Development Programme, 2012 informs that the various natural factors contribute in placing Nepal as one of the disaster risk zones.

The paper, “Nepalese Government Management of the U.S. Military Support During the 2015 Earthquake Relief Effort in Nepal,” by KC Subash, published by Marine Corps University, 2016. The paper provides valuable data related to the intensity and effect of the earthquake of Nepal, 2015. Similarly, the portal, Nepal Disaster Risk Reduction Portal of the Ministry of Home Affairs, Nepal provides data regarding the losses of life and property. Likewise, the report of the National Planning Commission, *Nepal Earthquake 2015* provides details on total earthquake affected districts of Nepal.

The report of the Nanyang Technological University (2016 32) explains that coordination and cooperation are usually the biggest challenges in the large-scale disaster responses. The report compiled by the OCHA ROAP (2014, 42) provides a definition of some of the relevant key terms used in the paper such as Cluster Approach, HuMOCC,

LEMA, NEOC, OSOCC, UNDAC, UN-CMCoord, and VOSOCC. Likewise, the research paper by Lamichhane (2016, 31) provided details on the HuMOCC. The paper, *The Crisis Response to the Nepal Earthquake: Lessons Learned* published by the EIAS, 2016 provided additional information on the Cluster Approach.

The Use of Military and Civil Defense Assets in Disaster Relief – Oslo Guidelines, Office for the Coordination of Humanitarian Affairs, November 2007. This document sets guidelines for member nations on the use of Military and Civil Defense Assets (MCDA) to support Humanitarian Assistance (HA) in foreign countries. It establishes the basic framework for formalizing and improving the effectiveness and efficiency of the use of foreign military and civil defense assets in international disaster relief operations. It is a practical guideline that sets standards and procedures regarding how the international military should support the Host Nation Authority (HNA). However, the guidelines have limited information specific to the MNMCC. It focused on MCDA without segregating the military and non-military MCDA. It also emphasizes on the conditions where United Nations Asset are present in Advance. However, unlike to Haiti, there was no significant presence of UN assets in Nepal.

International Strategy for Disaster Reduction, Hyogo Framework for Action, 2005-2015. July, Geneva: United Nations, 2007. This framework prioritizes the activities to be taken by the HA actors to make a substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries. It helps in coordinating prioritization of the disaster related activities. It emphasized that better the preparedness, the rescue and relief effort would be more coordinated and efficient.

OSOCC Guidelines. Office for the Coordination of Humanitarian Affairs, 2009. It is a guideline for the ad hoc coordinating center, usually chaired by OCHA to coordinate HA efforts during major disasters. It oversees HA activities of United Nations Country Team (UNCT), Non-Governmental Organizations (NGOs) and various civilian organizations. Furthermore, it has effective coordination with HNA including military, and with international military effort through MNMCC. It also informs regarding the UN Disaster Assessment and Coordination (UNDAC) that quickly arrives at the affected country and establishes a coordination forum until the establishment of the OSOCC. This guideline and the practices of these guidelines in other nations (including the earthquake in Pakistan and Haiti) can be compared with its implementation in Nepal. This comparison helps in identifying a gap in coordination, specifically of coordination between the MNMCC and the OSOCC. However, it does not cover the provision to coordinate the non-military SAR teams, if the arrival of UNDAC and the establishment of the OSOCC is delayed.

The OCHA report by Steffen Schmidt (2015 25), provides an overview on how the Oslo guidelines, the INSARAG guidelines, and the MNF SOPs are important to frame the functioning of SAR teams during disaster responses. The paper also notifies regarding how the MNF-SOP initiated the establishment of the MNMCC in emergency responses.

Summary

The reviewed literature provides adequate information regarding the coordinating challenges during the earthquake in Nepal in general. However, there is very limited research providing details on the coordinating challenges ,particular to the MNMCC. I

mentions minimum about the coordinating challenges within the MNMCC and the challenges in coordinating with other stakeholders including UNOSOCC and the NEOC. Similarly, literature provided brief insights on factors contributing to coordinating challenges, best practices and ways to mitigate such challenges.

Some of the evidence regarding the presence of coordination problems revealed in the review are the incidents related to the bottlenecking of assisting team and relief materials at the international airport, assisting team's lack of knowledge of the ground situation, and in some instances the ignorance of religious and cultural aspects of the host government. Likewise, events in the review such as the late arrival of some of the team with inappropriate equipment, arrival without the capability of self-sustainment, duplication of rescue and relief efforts in some areas, and absence of assistance in other affected areas verify the presence of coordination challenges of the MNMCC. The literature revealed a lack of effective information management system, exaggeration by media, conflicting interest of stakeholders, and the late initial response from the higher civilian active body were some of the major factors leading to such coordination difficulties. Likewise, the limited capacity of the airport including the cargo handling, gaps in provisions of the national and international guidelines related to disaster response, and inadequacy of disaster-related agreements also made the MNMCC's coordination difficult.

Regarding best practices, the reviewed literature highlighted the importance of establishing the MNMCC. Literature revealed how its absence during the Pakistan earthquake response and delay in its establishment during the Philippine's Typhoon Haiyan resulted in coordination difficulties. The literature also demonstrated how the

timely establishment of the coordination center, prior regional agreements, and conduct of multi-national joint exercises helped the Philippines to achieve greater coordination during Typhoon Hagupit response.

Similarly, regarding measures to improve the coordination of the MNMCC, the literature focused on the necessity for assisting teams to be self-sustaining, the requirement for self-awareness regarding cultural and religious sensitivities of the affected country, and the need to follow the international standards such as the INSARAG guidelines. The literature also emphasized on increasing the peacetime preparation to include various disaster-related agreements and joint exercises and establishing a better information management system. Some of the literature suggested to enhance the military command center and have the SAR efforts under one channel, create a disaster management council under the chairmanship of the prime minister, and need for the prompt and active involvement of the higher civilian body.

In addition to above information, various articles provided additional information such as the definition of disaster response related terms, facts, and figures of the earthquake of Nepal, and overview on the quake response. Such information helps to introduce the thesis to include the statement of the problem and the significance. So, there seemed to be sufficient information on the subject; however, there is limited perspective regarding the MNMCC. Most of all, there is very limited information regarding measures required to improve the coordination of MNMCC. The subsequent chapter discusses how this information from the review of the literature is analyzed to answer the primary research question of the research.

CHAPTER 3

METHODOLOGY

This chapter explains the research method used in the study and describes the study area, data collection methods, and the approach. This thesis has used the case study research approach. Case study research is a qualitative approach in which the researcher explores one or multiple cases through detail collection of data acquired from various sources (Creswell 2007, 73). Case study method is utilized to carefully examine and conduct an in-depth study of the collected data.

Research Setting

The thesis looks at the earthquake in Nepal, 2015 and the functioning of the Multi-National Military Coordination Center (MNMCC) established by the Nepalese Army. It focuses on the MNMCC and the other coordinating body established during the earthquake in Nepal. Despite the effectiveness of the MNMCC, it came across various coordinating challenges within the cell and with the National Emergency Operation Center (NEOC) and the On-site Operation Coordination Center (OSOCC). The study is targeted primarily to Nepalese Army (NA) and the GoN. The paper identifies the coordination challenges of the MNMCC and determines measures to improve it. The subsequent parts of this chapter illustrate the methods used in the collection of relevant data and further explains the analysis process utilizing CBA approach.

Data Collection

The paper formulated the primary research question and concurrently four secondary research questions to explore the coordinating challenges that came across.

The paper examined the secondary sources that comprise books, articles, reports, research materials, and websites. Scholarly articles were reviewed with a focus on seeking answers to the secondary research questions. Similarly, additional information such as introducing the context, explaining the modalities of the MNMCC, and the Nepal's National Disaster Response Framework (NDRF) were also reviewed.

The research mainly focuses on the MNMCC's functioning during disaster response and relief efforts; however, reviewed information and the data collection were targeted accordingly. The concept of establishing multinational coordination center was initiated after the earthquake in Pakistan that hit the nation in 2005. Thus, most reviewed literature are then onwards. Likely, the research work published after the 2015 earthquake were given importance. The subsequent part explains how the collected data were analyzed to determine the changes require enabling the MNMCC to coordinate the military responses during future responses better.

Analysis

The data collected from primary and secondary sources was analyzed from the capability-based assessment (CBA) approach. The CBA is the current deliberate process of how the U.S. military takes vision documents, analyzes them, adds details, and converts them to concepts, plans, and ultimately solutions for combat capability (Department of Logistics and Resource Operations 2016, 1). It is an analysis approach that provides recommendations to pursue a material or non-material solution to an identified capability gap that meets an established capability need (Rusten 2015, 9). The CBA forms the analytic basis of the Joint Capabilities Integration and Development System (JCIDS) process that is commonly used in U.S. defense planning (Department of

Logistics and Resource Operations 2016, 1). However, it is not limited to a certain nation or organization, and will, therefore, be suitable as a qualitative analysis tool for this thesis as well. This approach helps to conduct adequate analysis to pursue a required solution.

In CBA, the capabilities are investigated within the “domains” of doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF). Each DOTMLPF domain is an area providing focus to investigate solutions, products, and services to meet the required capabilities (Department of Logistics and Resource Operations 2016, 2). Due to the time limitation, and nature of the problem, the researcher, has focused on Doctrine, Organization, Leadership, and Policy (DOLP) out of the DOTMLPF domain.

The CBA analysis contains the Functional Area Analysis (FAA), Functional Needs Analysis (FNA) and Functional Solution Analysis (FSA) (Rusten 2015, 9). FAA is the first step of the CBA, and it identifies required capabilities and associated tasks to meet the mission objectives (Department of Logistics and Resource Operations 2016, 14). The purpose of FAA is to determine current and future required capabilities and tasks (Rusten 2015, 29). Such requirement of capabilities and tasks for the MNMCC has already been identified as a problem statement in chapter 1 of this thesis, it was identified that the MNMCC requires having better coordination during future disaster responses.

Similarly, the FNA is the second step of the CBA that list out the capability gaps, redundancies, and shortfalls (Department of Logistics and Resource Operations 2016, 15). It identifies and prioritizes gaps in operational terms. In this research, FNA helps to address the first, and the second secondary questions i.e. identification of the challenges for effective coordination and identifying the factors leading to such challenges. The

FNA in this thesis is analyzed in DOLP domain. Likewise, the FSA is the last step in the CBA and is an operationally-based assessment of all potential DOTMLPF approaches in solving or mitigating one or more capability needs or gaps (Department of Logistics and Resource Operations 2016, 15). FSA in this thesis analyzed the gaps from the FNA, and identify possible solutions across the DOLP pillar to improve the coordination of the MNMCC. It addressed the third, and the fourth secondary questions are i.e. determining the best practices in the functioning of the MNMCC, and recommending the measures required to improve the coordination of the MNMCC. This thesis applied a qualitative analysis of secondary data in the form of the FNA, and FSA.

After determining the general solutions (FSA) to improve the coordination of the MNMCC, the three commonly used evaluation criteria i.e. suitability, feasibility, and acceptability are utilized to evaluate the recommended solutions. Subsequently, the evaluated solutions are categorized into the DOLP framework.

Afterwards, the paper identifies the major stakeholders required to implement those changes. Further analysis is guided by the scope and limitation of this research. Finally, the evaluated changes (amongst the general recommendations) are converted into a short-term and long-term guidance for various stakeholders including the NA and the GoN.

The researcher being well aware of the importance of validity and reliability in the research made an effort to minimize errors in data collection phases and conducted cross verification through several sources. Figure 7 shows the conceptual framework regarding methodology applied to conduct this research.

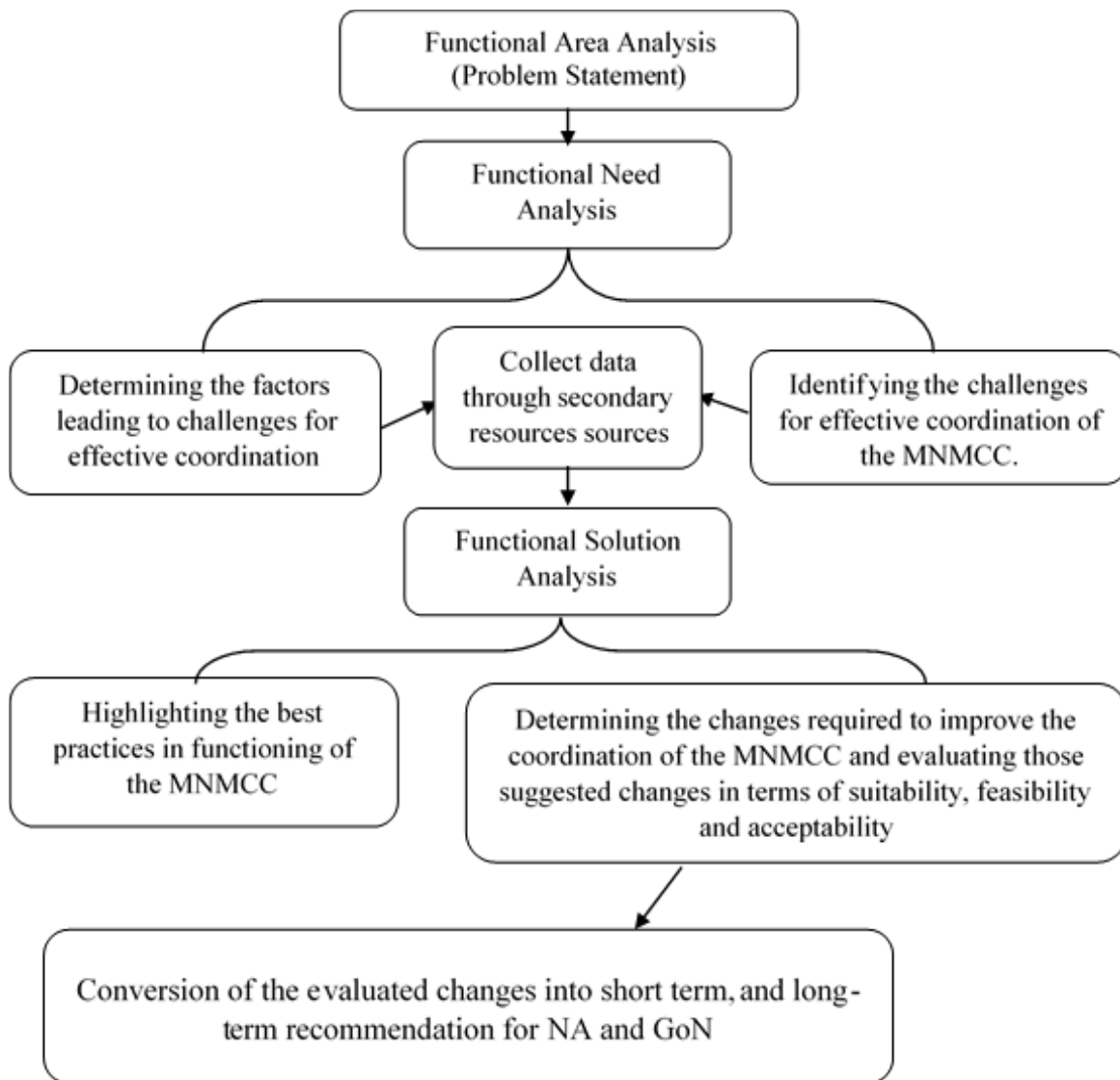


Figure 8. Research Model

Source: Created by the author.

CHAPTER 4

ANALYSIS

What changes could the GoN make in disaster response processes and procedures to enable the Multi-National Military Coordination Center (MNMCC) to better coordinate the military response during future responses?

This chapter conducts an analysis of the data acquired in chapter 2, review of the literature. As stated in the research methodology, the study covers three types of analysis based on the Capability Based Assessment (CBA) approach i.e. the Functional Area Analysis (FAA), Functional Needs Analysis (FNA) and Functional Solution Analysis (FSA). The researcher has considered the problem statement of this thesis as the FAA for conducting further analysis, which is the FNA and the FSA. The FAA initiated the data collection primarily based on the literature review. Organization of Literature review was according to the secondary questions of this research. The focus of this literature review was further narrowed down to the Doctrine, Organization, Leadership, and Policy (DOLP) lens of the CBA. Having DOLP lens on the examination of the literature, it contributes to conduct the FNA, and subsequently, the FNA helps to do the FSA. The solutions derived from the FSA will be evaluated through three criteria i.e. suitability, feasibility, and acceptability. The assessed solutions will lead to recommendations of chapter 5, which are categorized into short-term, and long-term recommendations.

Functional Need Analysis

The FNA helps to identify and prioritize the coordinating challenges of the MNMCC established by the Nepalese Army (NA). The FNA will assess the data

collected in chapter 2 considering the first two categories of the secondary research questions. The FNA is further divided into two parts i.e. the incidents indicating the challenges for effective coordination, and the factors leading to the coordination problems. The first part will list out and analyze the coordination challenges highlighted during the review of the literature in chapter 2. It covers 16 different incidents that indicated the coordination challenges. The second part will identify and analyze the factors leading to the coordination challenges across the DOLP domain. The successful analysis of the factor leading to coordination challenges determines the feasible solution for those particular problems.

Challenges for Effective Coordination

The delay in clearance of customs was one of the indicators of the challenges for the effective coordination in the earthquake in Nepal. Nepalese customs officials performed their regular inspection routines to relief packages, which led to a backlog of resources at the Kathmandu airport (Wendelbo et al. 2016, 46). The materials of the desperate need were delayed at Kathmandu airport, instead of being pushed out to victims (Ratcliffe 2015). The evidence exhibits that the Nepalese custom officials at the Tribhuvan International Airport, Kathmandu lacked a workable Standing Operating Procedure (SOP) or prior coordination to facilitate the quick and smooth entry of the responders, rescue equipment, and the relief items. The airport management had bare minimum knowledge on dealing with the emergency situation.

Likewise, another indicator of the lack of coordination in the airport management is the inability to manage the rapid inflow of SAR teams. There was a massive influx of USAR and other assisting teams in Kathmandu Airport. The airport with limited capacity

had to manage 2835 personnel of eight military teams from various countries had arrived within 48 hours of the earthquake. The delay in the arrival of the UN Disaster Assessment and Coordination (UNDAC) and other technical support teams indicates that coordinating mechanisms were not adequately operational (Schmidt 2015, 4).

The incidents related to the duplication of rescue and relief efforts in certain areas, and absence of rescue and relief efforts in other areas indicates the coordinating challenge within the MNMCC, and between the MNMCC and the On-Site Operation Coordination Center (OSOCC). After the establishment of the OSOCC, there was less coordination between the civilian SAR team and the Multi-Nation Force (MNF) SAR teams. They lacked a common operating procedure to synchronize their efforts and the area. In some occasions, the civilian SAR operated without coordination with the MNFs, and in some places, there were the duplications of efforts between the military teams. The MNMCC noticed that in some places there was discontinuation in the cooperation among the SAR teams (Subba 2015, 20).

Likewise, another report also highlights that some areas remained in isolation without any support whereas other had duplication of efforts. Four days after the earthquake, Sindhupalchowk, Banepa, Sankhu, and Rasuwa, the affected sectors close to Kathmandu had no rescue teams (Sharma 2015, 1). Different teams, in a series, were covering same areas with relief materials and healthcare, unaware of the efforts already undertaken (Wendelbo et al. 2016, 27). Lack of coordination between the team, neglected certain isolated areas from immediate rescue and relief effort. Such overlooking and duplication of an effort led to underutilization and unnecessary use of the scarce rescue resources. Lack of synchronization between the rescue and relief efforts indicates the

coordination challenges. In practical, the relief effort should follow the rescue efforts. However, some operational gap existed between the SAR and the humanitarian assistance. For instance, on some occasions, the team responsible for extrication of dead victims and medical services were missing after the initial SAR efforts (Schmidt 2015, 11-12). Thus, these incidents clearly represent the coordination lapses amongst various stakeholders.

Likewise, the reluctance in following the established coordination procedure in the National Disaster Response Framework (NDRF) showed the existence of coordinating challenge. Disaster response is a crucial event that requires sound coordination mechanism. In the NDRF the big three actors, the National Emergency Operation Center (NEOC), the MNMCC and the OSOCC, should have constant coordination with each other (Subba 2015, 6). However, in contrary to the laid down coordination procedures, the primary stakeholders (NEOC, MNMCC, and OSOCC) faced difficulties in coordinating within and with each other. The OSOCC should have maintained the direct contact with the NEOC; however, instead of having direct coordination with NEOC, the OSOCC mostly coordinated through the MNMCC (Subba 2015, 27). Incidence of some sorts of lack of coordination specifically between the OSOCC and the NEOCC had an effect on coordinating capability of the MNMCC.

There were several other incidents related to the assisting team's unawareness or late arrivals that indicated the existence of the coordinating challenges. Some of the international responders seemed to be incredibly unaware of the actual situation of the affected area. They were unaware of the scale of devastation, the real need of affected population, their responsibility, and were uninformed about the support they may or may

not receive from the affected country. Some of the international responders arrived with no idea regarding where their assistance was most needed (Wendelbo et al. 2016, 9). The example of the Belgian “B-Fast” rescue team indicates unawareness of the assisting team. The team arrived after four days with SAR equipment, whereas, by then medical and other support were of prime necessity (Wendelbo et al. 2016, 30-31).

In spite of the International Rules to be in affected area within 72 hours, some of the SAR teams arrived late, and few reached with the inadequate equipment (Subba 2015, 19). Past experiences and incidents show that the search and rescue efforts after 72 hours are less effective. The teams that operated within 48 hours rescued eleven of the sixteen live victims during Nepal earthquake (Schmidt 2015, 19). GoN had requested to stand-down international USAR teams; however, fifty-four USAR teams arrived even after the announcement, adding burden to the already overstrained international airport of Kathmandu and restricting the flow of essential medical teams and supplies (Schmidt 2015, 16). Out of fifty-four USAR teams that arrived in Kathmandu sixteen teams were military.

In another example, some relief team arrived with minimum situational understanding and without adequate prior coordination. The Nepalese Army (NA) noted that most of the MNFs came prepared and resourced and were self-sustained (Subba 2015, 19). However, some of the MNF teams could not self-sustain and burdened already overstretched system (Nepalese Army 2015, 43-44). For instance, a team of the NYC Medics’ had to wait several days in Kathmandu, before a helicopter (MNMCC resources) was available to deploy them to the required area (Wendelbo et al. 2016, 30-31). Likewise, the NA and other stakeholders did not have the adequate coordination to

predesignate and prepare the suitable sites in advance for the incoming military SAR teams (Nepalese Army 2015, 44).

Thus, earlier two examples related to the late arrival, and arrival with inadequate or inappropriate equipment clearly point out the existence of coordination challenges during the earthquake of Nepal.

Another incident indicates the presence of coordination challenge regarding ignorance of cultural and religious understanding of the affected nation. Due to the lack of effective coordination, the food items sent by the Pakistan contained beef; Nepal being Hindu dominated country, beef meat was unacceptable and illegal (Wendelbo et al. 2016, 24). Another incident explained hereafter related to cultural, sentimental and environmental also indicates the coordination challenge. In some places, the SAR team concentrated only on searching for live or wounded persons and denied to extricate dead victims (Schmidt 2015, 17). The failure to extricate deceased victims had consequences in health and environment. It also had sentimental and cultural value i.e. the relatives of dead victims needed the remains to perform final rituals according to their cultural practices. Thus, these examples justify the existence of coordination challenge that had an impact on the cultural, religious and sentimental value of the affected population.

Finally, there were instances related to air assets that indicate the coordination challenge at a higher level, which restricted the capacity of the stakeholders, particularly for relief efforts. For example, despite the vital importance of air assets, two Chinook helicopters of the Royal Air Force (RAF) ready to be flown in from nearby India were not given clearance either to leave India or to enter Nepal. Likewise, there were also restrictions, on flights carrying relief items, flying over Indian airspace (Jund and Sholler

2015, 17). Such coordination gap and restriction at a higher level limited the air assets that were vital for a mountainous country like Nepal. Thus, the Indian government's restriction limited the certain degree of flow of resources into the country and restricted the probability of having two additional helicopters, which could have proved vital in planning and coordinating air operation. The RAF Chinook helicopters, with a heavy lift capacity up to 10 tons of freight and capability to carry as many as seventy people for short journey, could have contributed a lot to meet the demands of relief distribution and air rescues (Gayle 2015).

Factors Leading to the Coordination Challenges

Based on the indicator of the challenges for the effective coordination, and the data reviewed in chapter 2, this section identifies and analyzes the factors leading to challenges. Factors leading to these challenges are further divided into four subcategories i.e. Doctrine, Organization, Leadership and Education, and Policy.

Doctrine

The gaps in international guidelines related to the disaster response and relief, and the gaps in certain provision of the NDRF are some of the major factors leading to coordination challenges. Firstly, there exists a gap in two internationally recognized guidelines i.e. the Oslo Guidelines and the MCDA Guidelines. The guidelines give adequate advice regarding the coordination and use of foreign military resources; however, it gives limited attention to instructions relating to the role of the military assets of the host nation (Thapa 2016, 5). The national militaries, particularly in developing countries, usually are the 'first resort' of governments in large-scale disasters (Thapa

2016, 5). Such inadequate information regarding the role of host nation militaries may undermine the perception (capability) of the Host Nation (HN) armed forces in the observation of the assisting militaries.

Likewise, the Oslo guidelines is a practical guide that set standards and procedures regarding how the international military should support the Host Nation Authority (HNA). However, the guidelines have limited information specific to the MNMCC. It focused on Military and Civil Defense Assets (MCDA) without clearly segregating the military and non-military assets (OCHA 2006, 3). It also emphasizes the conditions where United Nations Assets i.e. United Nations Military Civil Defense Assets (UNMCDA) are present in Advance. Furthermore, the Oslo guidelines mandate the UN representatives in the country to be responsible for coordinating military and non-military MCDA (OCHA 2006, 9). However, the MNF-SOP, international practice and the NDRF of Nepal have made the MNMCC responsible for coordinating military assets amongst the foreign MCDA. Unlike, Haiti, Nepal does not have prepositioned UNMCDA; and provision of greater responsibility of the UN over the military assets creates tension amongst the OSSOC (the UN and civilian coordinator) and the MNMCC (the military coordinator). Thus, the lack of update of Oslo guidelines and lack of its synchronization with recent guidelines and practice increases coordination challenges between the MNMCC and the OSOCC.

Secondly, certain provision in the NDRF contributed to the coordinating challenges within the MNMCC and the coordinating challenges of the MNMCC with the OSOCC and the NEOC. The NDRF envisions the OSOCC to coordinate the effort of the non-military SAR teams; however, delay in the establishment of the OSOCC increased

the coordination challenge (Nepalese Army 2015, 42-43). The OSOCC took approximately fifty-four hours to be effective (Nepalese Army 2015, 51). Due to delay in the establishment of the OSOCC, the MNMCC had to assume the responsibility to coordinate non-military SAR assets until the establishment of the OSOCC. Such unpredicted additional responsibility to the MNMCC contributed in coordination challenge within the MNMCC. Additionally, the limited cargo handling and parking capacity created difficulties in coordinating the handling, storage, supply and distribution of the relief materials (McCalment 2016, 16). It was also one of the factors for narrowing the capacity of the airport, thus delaying the incoming assistance. Therefore, the lack of effective standard procedures for the quick and smooth handling of cargo is also a factor leading to coordination challenge.

Likewise, the NDRF has mandated the MNMCC to coordinate all the military resources including the foreign military assistances, and the OSOCC is responsible for coordinating the non-military efforts (National Disaster Response Framework 2013, 8-9). However, some of the foreign armed forces were not purely the military effort; for instance, the majority of assisting troops from India belonged to their National Disaster Response force that is a force under the Home Ministry of India (NDRF-India 2015). Likewise, the United States military assistance to Nepal was under the USAID, which functions under the U.S Department of States (Subash 2016, 10). Thus, the lack of clear guidance regarding the management of non-military armed forces assets is a source that creates a coordination challenge.

Not only before the establishment of the OSOCC, but even after the creation of the OSOCC, there existed coordination problems. During initial days, there were

difficulties in coordination between the MNMCC and the OSOCC. The requirement for the collocation of the HuMOCC with the MNMCC, on an ad-hoc basis, without any doctrinal provision or procedure depicts the coordination challenges. It exhibited that lack of adequate doctrinal provision also creates coordination problems. The NDRF has the rule to establish a military command post within its premises for quick mobilization of the rescue and relief teams immediately, and requires the presence of the Brigadier General from the Directorate of Military Operation (DMO). However, in the NA, the Brigadier General of the DMO is a most responsible authority to manage and mobilize the resources of the NA and has to coordinate with the MNMCC to synchronize the national and foreign military assistance. Thus, the provision of establishing such command post within the NEOC was less practical during the disaster response to the earthquake of Nepal, 2015.

In addition to that, the NDRF's provision to establish a “Command Centre for the SAR Operation” at NEOC was not practical (Subba 2015, 31). Especially, the delay in the establishment of the OSOCC, and the delay in the efficient functioning of the NEOC during the earthquake response in Nepal showed these provisions to be unfeasible. Thus, the gaps in certain provisions of the NDRF is another factor contributing to the coordination challenges. It follows that the gaps in the international and national disaster management related guidelines contributed to the existence of coordination challenges of the MNMCC, Nepal.

Organization

The organization of the MNMCC, the NDRF, and the GoN authority contributed to the coordinating challenges. Firstly, the lack of effective information management is

one of the prominent factor resulting in the coordination challenges. In the 2015 earthquake, the most pressing needs were the relief efforts i.e. shelter, food, water and medication; however, the international media mainly focused on search and rescue (Wendelbo et al. 2016, 44). Due to the lack of robust and reliable information system, various data coming into the Centre from the available sources was at times conflicting thereby, leading to confusion and delay in prioritization and mobilization of existing resources (Pun 2016, 34). There was a need to provide real-time information, but the MNMCC did not have any cell related to the data management (Pun 2016, 28). Due to the difficulty in data management, initial damage assessment and identification of requirements were difficult (Nepalese Army 2015, 42). Even the information management within the NEOC was less productive; the information management software used in the NEOC for collecting data from the affected Districts was not very efficient, and it hindered effective mobilization of resources, thus complicating the relief distribution procedure (Nepalese Army 2015, 42). Likewise, the failure to update the Logistics Capacity Assessment (LCA) for several years restricted the ability to gain logistics information in the first days of the response (McCalment 2016, 41). Thus, the lack of effective media management body in the MNMCC and the NEOC was a contributing factor of coordination challenges.

Secondly, the delay in the establishment of OSOCC increased the coordination challenge (Nepalese Army 2015, 42-43). However, the organization of the MNMCC did not have any cell to coordinate the non-military efforts to compensate the absence of the OSOCC. Even after the establishment of the OSOCC, the OSOCC and the MNMCC faced difficulties in coordinating and synchronizing the activities of the military teams

and non-military teams. Therefore, the MNMCC and the OSOCC created an ad-hoc provision of collocating the Humanitarian-Military Operations Coordination Centre (HuMOCC), a segment of the OSOCC, with the MNMCC (OCHA 2015). Therefore, lack of prior visualization and establishment of such cells within the MNMCC contributed to the coordination challenges.

Thirdly, the NDRF's provision to establish a "Command Center for SAR Operation" at NEOC was not practical (Subba 2015, 31). The OSOCC was not operational during the first fifty-four hours. During that initial period, even the non-military efforts were coordinated by the MNMCC. Thus, the role and need of such command center for SAR Operation in the NEOC increased the coordination requirement. Likewise, even after the operationalization of the OSOCC, SAR efforts were conducted in close coordination between the OSOCC and the MNMCC. Here again, the requirement of the SAR operations command center in the NEOC seemed duplication of effort and added burden in coordination efforts.

Fourthly, the lack of the efficient airport ground handling body contributed in unnecessary delay for the incoming SAR and relief assets. Despite the lack of significant damage to the Kathmandu airport, limited cargo handling and parking capacity created difficulties in coordinating the handling, storage, supply and distribution of the relief materials (McCalment 2016, 16). Thus, the absence of the efficient functioning body in the airport was one of the contributing factors of coordination challenge. Therefore, the organization-related factors leading to the coordinating challenges are the lack of competent cells or sub-organizations in the MNMCC, the NEOC, the OSOCC, and the Airport Authority.

Leadership and Education

Issues with leadership and education also caused coordination challenges including the gaps regarding custom and cargo handling, situational awareness, leader's coordination were some of the leadership and education related factors leading to the coordinating challenges.

Despite earlier provisions, a considerable amount of delay was observed custom and cargo handling at Kathmandu airport. Before the earthquake, the GoN has signed the Customs Model Agreement to allow easier access to international responders, and there had been agreements with the OCHA to smooth customs clearance to facilitate the international assistance (Schmidt 2015, 9-10). However, the desperately needed materials were piling up at Kathmandu airport instead of being pushed out to victims. It highlighted the inadequacy of customs policy and procedures (Ratcliffe 2015). Therefore, it indicates that GoN and its authorities were responsible for delay and difficulties faced by assisting teams in the Kathmandu Airport. It showed the lack of awareness i.e. education and incompetence of airport officials and Foreign Ministry leadership. Such incompetence and lack of adequate knowledge regarding such transitional customs regulation could be one of the factors contributing to coordination challenge.

The GoN was not the only source of flawed education and leadership; there were also issues emanating from some of the assisting international teams. Insufficient or lack of proper paperwork could have also lead to such delay (Schmidt 2015, 9). Thus, the leadership of the incoming teams and lack of their education related to entry procedure could have added the coordination challenge. Likewise, as limited cargo handling and parking capacity created difficulties in coordinating the handling, storage, supply, and

distribution of the relief materials and contributed to such delay (McCalment 2016, 16). The lack of education and training, and lack of supervision of airport leadership also had contributed. Thus, indirectly, the leadership and level of expertise available for ground handling in the Kathmandu airport are also responsible for coordination challenge. It also shows the inadequacy in coordination between the MNMCC liaisons officers, to the NEOC, and the airport authority.

The lack of situational understanding is another major factor leading to the leadership and education related coordination challenges. Deficiency of connectivity delayed the updates on the Virtual On-Site Operations Coordination Centre (VOSOCC) and the use of electronic forms and templates (Schmidt 2015, 5). It resulted in failure to update the Logistics Capacity Assessment (LCA) for several years restricted the ability to gain logistics information in the first days of the response (McCalment 2016, 41). Such delay of updates on the VOSOCC deprived arriving assisting the teams from gaining the information that they require to prepare for providing necessary assistance. The feeble information management system not only affected the initial damage assessment and the identification of requirement, but also effected effective mobilization of resources during relief distribution. Such lack of adequate information obstructed the situational awareness of the incoming rescue and relief teams. The international media covering the news of the earthquake further confused the available information with the dissemination of confusing information. The real needs for Nepal were the relief efforts i.e. shelter, food, water and medication; however, the international media mainly focused on search and rescue (Wendelbo et al. 2016, 44). This could be one of the reasons behind the arrival of 54 USAR teams even after the GoN's request to stand-down of international USAR

teams. The SAR teams occupied the international airport's (Kathmandu) capacity restricting the flow of most needed medical teams and supplies (Schmidt 2015, 16). Thus, lack of accurate information is one of the factors leading to coordinating challenge.

Apart from the issues explained earlier, several other examples exhibit how the lack of situational understanding elevated the coordination challenges. For instance, the Singapore medical team faced difficulties to deliver medical care to victims in villages due to the lack of equipment to negotiate the deep mountain terrain and their inability to communicate in Nepali language (Ho et al. 2016, 430). Their inadequate knowledge regarding terrain, language, and associated difficulties would have created the problems. Similarly, the helicopter (UH-1Y Huey operated by the U.S. forces in the Joint Task Force 505) mishap was a result of lack of familiarity of terrain and unstable meteorological condition. The accident led to the death all on board, including two Nepalese Army Liaison soldiers (III MEF Public Affairs Office 2015). Better prior coordination regarding unpredictability of weather, hostile terrain feature could have prevented this accident. Likewise, initial orientation briefing by the reception desk team at the Airport should have more detail and handy information. It could have caused resources to be expended on this accident, rather than on earthquake relief.

Lack of understanding or education regarding interoperability also leads to coordination challenge. For instance, the U.S. military typically operates in classified channels that prevent other militaries from sharing information easily (Weilant 2016, 19). The Nepalese Army had various disaster-related seminars and workshops with the U.S. military, but there were very limited exercises with troops to ensure commonality. The lack of interoperability between the potential supporting nations coupled with the lack of

compatible communication, means and procedures and the security interests increases the coordinating challenge. Likewise, there was the absence of pre-coordinated plans or resource management amongst major stakeholders (NEOC, MNMCC, and OSOCC) of Nepal, and it resulted in tension during disaster response (Lamichhane 2016, v). It highlights that there were minimum engagements between the leaders of various stakeholders, and lacked the prior coordination to synchronize their plan. It could be one of the reasons leading to duplication of efforts in some areas while leaving gaps in other sectors. Thus, the inadequacy of leader engagements before the earthquake may also be a factor leading to the leadership and education related coordination challenge.

Thirdly, the lack of effective leaders also produced the coordination challenge. The leadership of the OSOCC, particularly the first arriving UNDAC representative seemed to lack leadership skills, thereby delaying the operationalization of the OSOCC. The UNDAC leader was delayed only by 24 hours, but it took some 54 hours for the OSOCC to become active (Nepalese Army 2015, 51). The delay in the establishment of the OSOCC added the coordination challenges for the MNMCC. It added the additional responsibility of the OSOCC to coordinate non-military SAR. The more active leadership role of the UNDAC leader could have established the OSOCC earlier.

Likewise, the absence of senior leadership during the initial period of the disaster response was one of the greatest issues with coordination. Although the mobilization of all the security agencies including the Nepalese Army was in effect immediately after the April 25th earthquake, there was an absence of active higher civilian body to coordinate the efforts of all the concerned sectors (Nepalese Army 2015, 41). Thus, it was difficult to achieve an effective coordination among various sectors, and it affected the relief

material collection and distribution mechanism. Therefore, some of the major factors leading to leadership and education related coordinating challenges were the incidents related to the custom and cargo handling, lack of situational awareness, and leadership activities.

Policy

The gaps concerning the lack of agreements and inadequacy in formulating and implementing various policies were some of the policy-related factors leading to the coordinating challenges. There existed the lack of coordination with the regional countries. Lack of such coordination exacerbated the congestion at the only international airport of Nepal, particularly due to the early and uncoordinated arrivals from India, Pakistan and China (Wendelbo et al. 2016, 10). Response time is clearly of the essence, but in this case, the quick response made coordination difficult. Thus, it indicates that lack of prior coordination and agreements with the neighboring countries increased the coordination challenges at the outset of the disaster response. Likewise, the South Asian Association for Regional Cooperation (SAARC) is seen unconcerned regarding the issue of regional approaches to disaster management (Lamichhane 2016, 55). The SAARC has established the SAARC Centre for Disaster Management and Preparedness (SDMC) in New Delhi; however, it has not yet set up a dedicated SAARC Disaster Management rapid action force (SDMRAF) (Lamichhane 2016, 33).

Similarly, despite of the vital importance of air assets, two Chinook helicopters of the United Kingdom ready to be flown in from nearby India were not given clearance either to leave India or to enter Nepal. Likewise, there were also restrictions on flights carrying relief items being flown to over Indian airspace (Jund and Sholler 2015, 17).

Such coordination gap and restraint at a higher level limited the air assets that were vital for a mountainous country like Nepal. Hence, lack of prior agreements with neighboring countries, lack of previous agreements, and SAARC's failure to activate SDMRAF contributes to the coordination challenge.

Lack of implementation of effective policies such as international guidelines, media policy, and custom policy also contributed in encouraging the coordination challenges. The international agreements and practice of adopting International Search and Rescue Advisory Group (INSARAG) guidelines faced challenges during earthquake response in Nepal. All the INSARAG members are required to abide by the INSARAG Guidelines as an integral part of their national disaster management framework. Nepal is a member of INSARAG; however, only eighteen of the seventy-six responding international SAR teams were a member of the INSARAG. Likewise, not all USAR teams met the standard set by the INSARAG guidelines (Schmidt 2015, 4). As the majority of the responding teams were not members of INSARAG, they did not function according to INSARAG methodology and guidelines (Schmidt 2015, 13). It may have been one of the reasons to have issues regarding coordination amongst the SAR and relief teams. Some assisting groups denied operating in the designated sectors. Those teams seemed to have conflicting interest, as they were seeking for those sites that have more media attention (Schmidt 2015, 11). Thus, inadequacy in the implementation of already laid down policy such as provisions of the INSARAG guidelines contributed to coordination challenges. Similarly, it indicates that lack of policy regarding the procedures to coordinate team not belonging to INSARAG SAR teams could be another

contributing factor in coordination challenges, as only 18 SAR teams out of 76 were INSARAG qualified.

Similarly, the lack of policy mandating the MNMCC to coordinate non-military armed forces also seemed to be the contributing factor. The MNMCC is responsible for coordinating all the military resources including the foreign military assistances, and the OSOCC is in charge of coordinating the nonmilitary efforts (National Disaster Response Framework 2013, 8-9). However, the MNMCC was coordinating the efforts of some of the non-military international forces such as the forces of India and the U.S. troops under the USAID. The National Disaster Response Force of India that assisted during disaster response in Nepal was the non-military assets (NDRF-India 2015). The NDRF-I is a paramilitary force not under the Defense Ministry, but under the Home Ministry of India (Indiatimes 2014). Likewise, OSOCC was responsible for coordinating the non-military efforts, but It took some fifty-four hours for the OSOCC to become full operational (Nepalese Army 2015, 51). Due to the delay in the establishment of the OSOCC, all the incoming military as well as the non-military SAR coordinated with the MNMCC. Thus, the MNMCC had to assume the responsibility to coordinate non-military SAR assets until the establishment of the OSOCC (Subba 2015, 31). Therefore, lack of effective policy mandating the MNMCC to coordinate the efforts of the non-military efforts was a factor leading to the coordination challenge.

In Nepal, the international media mainly focused on search and rescue, whereas the real needs at that moment were the relief efforts (Wendelbo et al. 2016, 44). Thus, the lack of effective media policy seemed to have contributed to coordination challenges. Likewise, insufficiency in the implementation of customs related policy also resulted in

increasing coordination challenges. The GoN has signed the Customs Model Agreement before the earthquake, to allow easier access to international responders. There also had been agreements with the OCHA to smooth customs clearance to facilitate international assistance (Schmidt 2015, 9-10). However, despite such agreement, the custom clearance and immigration procedures in Nepal during the earthquake was time-consuming. The authority for duty of the Kathmandu airport did not adequately implement the custom policy agreed earlier for such disaster responses. It resulted in piling up of the desperately needed materials at Kathmandu airport instead of being pushed out to victims (Ratcliffe 2015). It highlighted the inadequacy or lack of implementation of the custom policy and procedures. Therefore, the policy related factors contributing to coordination challenges are the gaps regarding the lack of agreements and inadequacy in formulating and implementing various policies.

Functional Solution Analysis (Combination of 3rd and 4th secondary question)

This section seeks to apply the FSA based on the FNA in the previous section and the literature review in chapter 2, under the third and the fourth category i.e. the best practices, and measures required to improve the coordination. In subsequent paragraphs, the solutions are analyzed, and subsequently, examined solutions are evaluated vis-à-vis suitability, feasibility, and acceptability in the context of the NA and Nepal. Accordingly, categorization of the evaluated solutions are carried out as per doctrine-related, organization-related, leadership and education-related, and the policy-related solutions. This section will support chapter 5 to recommend the evaluated solutions to various stakeholders, in the form of short-term, and the long-term recommendations.

Before going into the details of FSA evaluation, the defining suitability, feasibility, and acceptability as evaluation criteria are necessary.

Feasible means the solution that can accomplish the mission within the established time, space, and resource (Department of the Army 2015, 9-17). The solution is feasible if it can be executed with the forces, support, and technology available to the GoN within the constraints of the physical environment (Department of Defense 2011, IV-24). The feasibility is about evaluating whether the assigned mission can be accomplished, using available resources, within the time contemplated by the plan (Department of Defense 2013, 99). However, for this thesis, there is no required timeline, and the aim is to determine the changes required, in the NA, and the GoN, for better coordination of military response during future responses. Thus, the solution from the FSA is feasible if the solution is within the capability and resources of the NA and the GoN.

Likewise, acceptable means that the solution must balance cost and risk with gained advantage (Department of the Army 2015, 9-17). The solution is considered to be acceptable if the estimated results justify the risks. The joint publication refers the Course of Action acceptable if it is proportional, worth the cost, consistent with the law of war; and is militarily and politically supportable (Department of Defense 2013, 1). For this thesis, there is not severe risk involved. Thus, the solution is acceptable as long as the solution is militarily, and politically supportable.

Similarly, suitable means that solution can accomplish the mission within the commander's intent and planning guidance (Department of the Army 2015, 9-17). The solution from the FSA is suitable if the solution directly or indirectly helps in improving

the coordination of the MNMCC. The solution should focus on improvement of the MNMCC's coordination.

Now, the subsequent paragraphs provide the FSA and evaluate those solutions. The solutions are related to the best practices of the NA or other militaries that are to be continued, and the other solutions specifically related to disaster management in Nepal.

There were various good practices related to the coordination of the MNMCC. This section includes best practices in reference to the typhoons of Philippines (2013 and 2014), earthquake in Pakistan (2005), and the earthquake of Nepal (2015). The Philippines learned from the consequence of delaying the establishment of the Multi-Nation Coordination Center (MNCC) during the response to Typhoon Haiyan (Weilant 2016, 18). The Philippine government acted well in responding to the Typhoon Hagupit, 2014, as it established the MNCC on time. Likewise, the timely establishment of the MNMCC of the NA played a pivotal role in coordinating the national and international military efforts (Nepalese Army 2015).

Besides, Nepal proved effective in comparison to Pakistan when it responded during an earthquake in 2005 AD (Wendelbo et al. 2016, 51). Thus, Nepalese stakeholders should continue in following the NDRF, and continue establishing the MNMCC immediately after the large-scale disasters. It is feasible, acceptable and suitable to keep following the practice of implementing the NDRF and setting of the MNMCC as before.

The other reason for effective coordination by the Philippines in 2014 was a result of the three days continued humanitarian assistance and disaster response exercise conducted by the Armed Forces of the Philippines (AFP) (Asia News Monitor 2015). In

Nepal also, the training and exercises of the Program for Enhancement of Emergency Response (PEER), helped to increase the effectiveness of the Nepalese Armed Forces during disaster response (Dixit, Guragain, and Shrestha 2015, 8). These cases of the Philippines and Nepal exhibited that the peacetime preparation amongst national armed forces increased interoperability amongst the various stakeholders during disaster response. Thus, Nepalese stakeholders should continue and enhance their involvement in various joint training, exercises, and seminars to improve their interoperability. This solution is feasible, acceptable and suitable.

Similarly, the Philippines government had prior bilateral agreements with potential responders, thus receiving timely assistance from the regional ASEAN entities (CFE-DM 2015, 14-16). However, Nepal faced many coordination challenges due to the inadequacy of such agreements. Likewise, another valuable lesson from the Philippines case is that the ASEAN's effort to establish a regional disaster mechanism which greatly complemented international relief assistance and facilitated coordination between military and civilian agencies (Anthony, Cook, and Trajano 2015, 2). Whereas, the SAARC has established the SDMC but has not yet set up a dedicated SDMRAF (Lamichhane 2016, 33). These case of the Philippines and the ASEAN, and Nepal exhibited that the GoN needs to have prior bilateral and regional agreements with the numbers of potential responding countries. The arrangements of Memorandum of Understanding - MOU, and Status of Forces Agreement - SOFA well in advance with identified countries will expedite the assistance process (Subba 2015, 32). The SAARC needs to implement the establishment of the SAARC Disaster Management rapid action force. These solutions are acceptable and suitable, but less feasible because these

solutions are not limited only to the domain of the GoN. It involves multiple countries and regional organizations. However, the GoN can take additional initiatives to engage potential responding countries to have as many disaster management related agreements as possible.

Likewise, during typhoon response in 2014, the Philippines had benefited from holding multiple airfields and approaches by the sea from any direction (McCalment 2016, 28). This accessibility greatly simplified the rescue and relief effort. Whereas, Nepal was restricted to a single military-grade runway, and required overflight requirements with a dozen other countries (McCalment 2016, 28). It shows that it is good practice to improve accessibility with existing air route agreements. Nepal should also have an alternative runway that has a capacity to receive international assistance. This solution is acceptable and suitable. However, it is less feasible at the moment due to the lack of other international airports. Nevertheless, within few years, Nepal will have more alternative international airports (NP News Portal 2017).

Due to the delay in the establishment of civilian supervising authority, the foreign militaries directly coordinated with the NA through the MNMCC in contrast to the international mechanism (Awwal et al. 2016, 18). Therefore, the NA established the good legacy of taking the initiative and adjusting international mechanism according to the situational requirement. Taking such initiatives in future may be feasible and suitable, but it may not be acceptable as coordination of civilian assisting teams may not be politically supportable.

The UNOSOCC and the MNMCC reduced the coordination gap by co-locating the HuMOCC with the MNMCC (OCHA 2015). The MNMCC had termed that co-

located coordinating cell as the JCC. The establishment of the HuMOCC/JCC greatly facilitated in documenting and reacting to the Request for Assistance (RFA) and Request for Information (RFI), information sharing, and synchronization of military and non-military efforts (Thapa 2016, 10). Thus, the NDRF of Nepal should have a provision to design a JCC within the MNMCC, which is the MNMCC term for restructured HuMOCC. This solution is feasible, suitable and acceptable.

It is essential for the foreign assisting teams to be self-sustained during the disaster response and relief operations (OCHA ROAP 2014, 12). They should be self-sustain and avoid putting the additional burden on the host nation authorities and resources or another stakeholder in the affected area (Subba 2015, 20). Thus, enlisting those conditions during the request for the international assistance could eliminate these problems seen in the field. This is the feasible, acceptable, and suitable solution.

As explained in the earlier chapter, some assisting nations and the team were found to be ignoring the cultural, religious and sentimental values. Nepal is a secular country with many following Hinduism. The beef meat is forbidden in Hindu religion, and many people in Nepal do not eat beef for the religious values; However, beef products were discovered in the food item sent from Pakistan (Wendelbo et al. 2016, 24). Thus, it illustrates the ignorance and negligence of few countries involved in international assistance. Similarly, as explained earlier, the international SAR teams concentrated only on searching for live or wounded persons and denying to extricate human remain (Schmidt 2015, 17). Whereas, extraction of the human body had a direct impact on the health and environment, culture, and sentiments. The assisting States and its military forces should consider the cultural and religious sensitivities of the Affected Population

(OCHA ROAP 2014, 12). Therefore, GoN should coordinate with respective countries to avoid such accidents during future responses. Thus, it is feasible, acceptable and suitable. Likewise, there should be a policy of not leaving behind the human remains, and having follow-up teams to recover those human remains. Thus, this solution is not feasible, as it is beyond the scope of the GoN and required International consent and understanding. However, the GoN, and the stakeholders can raise this issue to various disaster-related seminars, exercises, and conferences. Likewise, the MNMCC and the OSOCC can coordinate to organize a follow-up team to support the SAR team that are only limited to search and rescue survivors. Equally, various disaster response teams of Nepal should have joint exercises to include plans for recovering human remains without burdening SAR teams.

The delay in the establishment of the OSOCC resulted in confusion amongst the non-military groups, and the MNMCC took primary responsibilities, thus overcoming the immediate challenge (Aaron, Wooldridge, and Sholler 2016, 17). Until the OSOCC is fully functional, the coordination of the SAR operations should be the responsibility of the MNMCC. Likewise, in the immediate aftermath of the earthquake, there was an absence of active higher civilian body, to coordinate the efforts of all the concerned sectors (Nepalese Army 2015, 41). The NDRF should authorize the NA a lead role in certain tasks until the responsible Governmental Agency is prepared to take the lead. There is a necessity for an enhanced military command center and have the SAR efforts under one channel for smooth coordination to compensate those delays (Subba 2015, 20). Therefore, there should be authorized mandate for the NA to deal with non-military force SAR team until the NEOC or the OSOCC is fully functional. This solution is feasible and

suitable as it is within the scope of the GoN. It is not politically supportable, thus not acceptable, as the Office for the Coordination of Humanitarian Assistance (OCHA) and other international civil agencies may not agree to authorize the MNMCC to coordinate the non-military SAR team by the MNMCC.

Similarly, the MNMCC is responsible for coordinating all the military resources including the foreign military assistances, and the OSOCC is in charge of coordinating the nonmilitary efforts (National Disaster Response Framework 2013, 8-9). However, the MNMCC was coordinating the efforts of some of the non-military international armed forces such as the forces of India and the U.S. troops under the USAID. Thus, the NDRF should clearly state the coordinating authority of the MNMCC over the non-military armed forces as well. It is acceptable and suitable; but it may not be feasible, as authorizing such amendments requires coordination with international stakeholders and synchronization with international guidelines. However, the GoN and the NA can raise this issue in various national, regional and international events.

The lack of information management was one of the prominent factor leading to the coordination challenge. There was a need to provide real-time information, but the MNMCC does not have any cell related to the information management (Pun 2016, 28). Due to the difficulty in the information management, initial damage assessment and the identification of requirement was difficult (Nepalese Army 2015, 42). Likewise, the failure to update the Logistics Capacity Assessment (LCA) for several years restricted the ability to gain logistics information in the first days of the response (McCalment 2016, 41). The international media worsen the situation as it exploited the gap in information with media's exaggeration. In Nepal, the real needs were the relief efforts i.e. shelter,

food, water and medication; however, the international press mainly focused on search and rescue (Wendelbo et al. 2016, 44).

Even the information management within the NEOC was less productive; the information management software used in the NEOC for collecting information from the affected Districts was not very effective (Nepalese Army 2015, 42). The availability of systematized and structured information helps in providing the actual need, and avoid unnecessary involvement. (Schmidt 2015, 9-10). Thus, the NEOC should update its information management mechanism and assets, and the National Disaster Management Authority (NDRM) should coordinate with various stakeholders to formulate a possible list of the requirement in the case of large-scale disasters. The GoN can then immediately revised and post the list of requirements according to the type and effect of the disaster. It is a feasible, acceptable and suitable solution.

Furthermore, there should be pre-determined agreements with the specific government and militaries regarding the assets that assisting nation can immediately mobilize. It is suitable, but it is not feasible as it is not only limited within the scope of the GoN. Equally, the INSARAG Regional Groups should be more active to enable USAR teams to have a better understanding of the INSARAG system and tools (Schmidt 2015, 13). However, this solution is not feasible being beyond the scope of the GoN. Likewise, the report from the Regional Consultative Group has recommended having an interoperable monitoring system to track the use and allocation of military assistance (Regional Consultative Group 2015, 3). It is a less feasible solution, as it is not within the capacity of the GoN. However, the GoN can consistently engage bilaterally and

regionally through various disaster-related forums to recommend solutions explained beforehand.

Additionally, the MNMC should have effective media management cell. It is a feasible, acceptable and suitable solution. Similarly, the GoN should implement effective media policy to deny exaggerated coverage of the international media. However, this may not be an acceptable solution from political and social perspective. Therefore, instead of having a gap in information and allowing the possibility of media's exaggeration, the GoN, and or the MNMCC in coordination with the OSOCC should take initiative to engage international media. They should proactively provide information through various media conferences, press releases, and other media interactions. For efficient management, uniformity, and synchronization, the MNMCC should have its media management cell that synchronizes the information with the NEOC and the OSOCC. It facilitates in information sharing as well. It is the feasible, acceptable and suitable solution.

Equally, there existed the lack of coordination with the regional countries. Lack of such coordination exacerbated the bottlenecking of the only international airport of Nepal, particularly due to the early and uncoordinated arrivals from India, Pakistan, and China (Wendelbo et al. 2016, 10). Likewise, despite the vital importance of air assets, two Chinook helicopters of the United Kingdom ready to be flown in from nearby India were not given clearance either to leave India or to enter Nepal. There were also restrictions on flights carrying relief items being flown to over Indian airspace (Jund and Sholler 2015, 17). Hence, the GoN should have a bilateral agreement with India, and other neighbors regarding the overflight and other related issues. It may be less feasible;

however, GoN should continue to push in gaining agreement by utilizing regional and international forum such as the SAARC and the United Nations Organization (UN).

Lack of the operative custom procedure and airport ground handling organization contributed in unnecessary delay for incoming SAR and relief assets. Limited cargo handling and parking capacity created difficulties in coordinating the handling, storage, supply and distribution of the relief materials (McCalment 2016, 16). Due to the ineffectiveness of ground handling and cargo management, the NA utilized its personnel for managing the storage of relief supplies that were pouring rapidly. NA had to play a significant role in coordinating the movement of such aircraft (Nepalese Army 2015, 47). There is a need for NA in future disaster to continue such support. The NA is prepared and capable of establishing and running the Airport Liaison and Logistics Operations Centre if the NDRF mandate the NA as such (Nepalese Army 2015, 47). Likewise, the effectiveness of reception desk at the Airport and the Airport management is critical (Subba 2015). Thus, it is better to have a separate airport cell under the MNMCC which would be responsible for airport liaison and logistic operations. It is suitable, acceptable and feasible as well. The NDRF should establish the provision to form a separate airport cell.

Similarly, desperately needed materials were piling up at the Kathmandu airport instead of reaching out to the targeted groups. It highlighted the inadequacy of customs policy and procedures (Ratcliffe 2015). It indicates the lack of awareness i.e. education and incompetence of airport authority and foreign ministry leadership. Thus, the Central Natural Disaster Relief Committee (CNDRC) should conduct prior coordination to ensure that the customs authority would implement emergency custom policy during future

disaster responses. It is feasible, acceptable and suitable solutions. Equally, the incoming assisting teams should have adequate documents to meet the custom obligations.

However, this solution may be less feasible as it is beyond the scope of the GoN; nevertheless, the GoN should list out the custom requirements during its request for international assistance. Likely, the MNMCC can ensure that the liaison officers have detail knowledge about the custom requirements and can assist respective assisting militaries.

The gaps in international guidelines related to the disaster response and relief, and the gaps in the certain provision of the NDRF were some of the major factors leading to coordination challenges. The Oslo Guidelines and the MCDA Guidelines guides the foreign military assets, but gives limited attention regarding the role of the military assets of the host nation (Thapa 2016, 5). The national military, particularly in developing countries, usually are the ‘first resort’ of governments in large-scale disasters (Thapa 2016, 5). Likewise, these guidelines mandate the UN representatives in the country to be responsible for coordinating the military and non-military MCDA, and contains limited information specific to the MNMCC (OCHA 2006, 9). The MCDA guideline does not adequately segregate between the military and non-military assets (OCHA 2006, 3). Thus, precisely the Oslo guideline 2006, and other guidelines need to be updated to include guidance for the MNMCC.

Similarly, most of the international SAR teams failed to follow or meet the standard of the INSARAG guidelines. Only 18 of the 76 responding international SAR teams were INSARAG classified, and not all teams had the capacity required for a USAR teams (Schmidt 2015, 4). They did not function according to INSARAG methodology

and guidelines (Schmidt 2015, 13). There is a lack of policy regarding the procedures to coordinate teams not belonging to the INSARAG. Thus, there is a need to have updates on the INSARAG guidelines. Other guidelines also require including provision facilitating the affected nation in better coordination of the SAR efforts. It is not feasible for the GoN to directly influence to bridge the gap, but during various meetings, it can push stakeholders to integrate the role of the HN armed forces.

Immediately after the earthquake, there was an absence of a higher civilian body to coordinate the efforts of all the concerned sectors. The need for an active body to assume the leading role in coordinating the efforts of all the teams in the field is essential (Nepalese Army 2015, 41). Thus, the NDRF's provision for the MNMCC to operate under the authority of the Ministry of Home Affairs (MoHA) created difficulties. The report recommends that instead of having the ministry function under the MoHA, it is effective to establish disaster management council under the chair of the Prime Minister (Nepalese Army 2015, 45). It is a suitable solution; however, it is less feasible, as it may require making a significant amendment in the constitutional provision of Nepal. Equally, it may not be acceptable being politically debatable between the MoHA and Ministry of Defense, and it is suitable to minimize the coordination friction within the NDRF structure. Likewise, a separate and dedicated disaster response force can be created directly under the MoHA. We can take the reference of the National Disaster Response Force of India as an example, which is specially trained and equipped for the disaster management and it is a force under their Home Ministry. GoN can make similar provision of creating a dedicated force under the MoHA. This solution may take time, but

it is feasible and acceptable. However, it may not be suitable because it is not related to the coordination challenges of the MNMCC.

In the NDRF structure, the NA has to establish a military command post within the compound of NEOC, and it requires the presence of the Brigadier General from the DMO of the NA. However, the Brigadier General of the DMO is a most responsible authority to manage and mobilize the resources of the NA. So, sparing him in such command post comprises the coordination within the NA, and between the NA and the MNMCC. Thus, the provision of establishing such command post within the NEOC should be amended. Therefore, when it comes to the presence of DMO commander in the command post, possibilities seems minimum. Thus, either the Brigadier of the DMO should be replaced with other higher ranking officer or, the command post established near to the MNMCC. It is feasible, acceptable and suitable to replace with another officer from the NA, but is not acceptable to relocate the command post. The command post comprises the representation from other armed forces of Nepal, so the NEOC requires locating the command post near to it.

Likewise, NDRF's provision to establish a "Command Centre for the SAR Operation" at the NEOC was not practical (Subba 2015, 31). Such center would have been effective only if the MNMCC and the OSSOC both concurrently start coordinating the military and non-military efforts respectively. Particularly, the delay in the establishment of the OSOCC, and delay in the effective functioning of the NEOC during the earthquake response in Nepal showed these provisions to be unfeasible. Thus, until the establishment of the OSOCC, the Command Center at the NEOC for SAR Operation should be inactive, and the NEOC should allow the MNMCC to have overall authority to

coordinate the SAR efforts. It is a feasible, and suitable option; However, it is not acceptable as it may be politically unsupportable.

Similar to the OSOCC, the MNMCC is also the ad hoc coordination center established during the large-scale disasters only. The NEOC is the only permanent setup under the NDRF (National Disaster Response Framework 2013). Such sudden activation of the MNMCC only after the disaster may not be very useful. Therefore, it is better to have small but permanent (long-term) staffing of the MNMCC to facilitate early situational understanding. It is the feasible, acceptable and suitable solution. Similarly, the MNMCC was limited with only one central coordination center located in Kathmandu; however, OSOCC, later on, established regional offices and this decentralization of the OSOCC facilitated better coordination. The MNMCC was dependent only on the liaison officers and the NA local units for coordination in other regions of Nepal. Thus, NA and the CNDRC should have the plan to establish regional MNMCC. Likewise, the MNMCC organization does not have provision to coordinate with other branches of the Army HQs (Pun 2016, 28). A frequent coordination and exchange of information with the operation cells, intelligence cells, logistics cells and NA Directorate of Public Relation (DPR) were essential. The problems in lack of coordination created the situation for the multiplication and delay in allocating the task and delay in taking a decision. Thus, the MNMCC should have a common information-sharing platform with the DMO of the NA. These solutions are feasible, acceptable and suitable.

As mentioned earlier, it took twenty-four hours for the UNDAC to arrive in Kathmandu, but then again it took some fifty-four hours for the OSOCC to function fully

(Nepalese Army 2015, 51). The UNDAC's delay in operationalizing the OSOCC increased the coordination challenges of the MNMCC, and added additional responsibilities of coordinate non-military SAR assets as well. Thus, the UNDAC should arrive sooner and make the OSOCC as early as possible. It is an acceptable and suitable solution; however, may not be feasible as the OSOCC functions under the OCHA. Hence, the GoN should push the Residential Coordinator (RC) of the UN, and other stakeholders to ensure the early establishment of the OSOCC.

Evaluated Solutions of the FSA

The above-recommended solutions are categorized into the Doctrine, Organization, Leadership and Education, and Policy. The categorized evaluated solution (Appendix C) will be a source for chapter 5 for producing short-term and long-term recommendations, advantageous for various stakeholders.

Conclusion

This chapter utilized CBA approach in analyzing data with a focus on the FNA, and the FSA. The FNA systematically analyzed the secondary data collected from the literature review by an emphasis on the secondary research questions and the DOLP framework. The FNA in this chapter utilized DOLP framework to categorize factors leading to the coordination challenges of the MNMCC. The FNA and the chapter 2 contributed in conducting the FSA. The solution derived during the FSA was evaluated keeping consideration on the feasibility, acceptability, and suitability. The solution met feasibility when the solution focused on the aim of the research within the capability and resources of the GoN and associated stakeholders. The solutions achieved acceptability

when the solution was militarily, and politically supportable. Likewise, the solution was suitable, when they directly or indirectly helped in improving the coordination of the MNMCC. Finally, categorization of the evaluated solutions were conducted into the DOLP framework. The following chapter (chapter 5) will cover the findings based on the FNA of this chapter. Likewise, it will produce the short-term and long-term recommendations beneficial for various stakeholders concentrating on the FSA of this chapter.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the major ideas discussed and analyzed so far in the thesis, and provides recommendations. The conclusion briefly highlights the background of the thesis, and provides a brief overview related to the primary and secondary questions of this thesis. The conclusion also provides the researcher's personal learning insights and growth because of engaging in this research approach and effort. The evaluated solutions derived in chapter 4 is the basis for the recommendation further categorized into short-term and long-term recommended actions to the key decision makers; the Nepalese Army (NA), and the Government of Nepal (GoN. This chapter will also include the suggestions for the next round of research for the next researcher.

Conclusion

Immediately after the devastating earthquake that struck Nepal on 25 April 2015, the Nepalese Army established the Multi-Nation Military Coordination Center (MNMCC) to coordinate Multi-National Forces (MNF) engaged in the disaster response. Four thousand one hundred and seventy-five (4175) MNF from eighteen different militaries provided support in the form of Search and Rescue (SAR), medical, epidemic control, water purification, air transportation and rescue, road clearance, debris management, and stabilization. In general, national and international participants and observers praised the MNMCC's effort; however, there still is room for improvement in the coordination of the MNMCC to synergize better and better utilize the wide range of MNF resources during future disaster responses. Therefore, the purpose of this research

paper was to determine the changes that the GoN could make in emergency response processes and procedures to enable the MNMCC to better coordinate during future responses. The paper formulated and analyzed four secondary questions to disclose the challenges and determine the best solutions: The research questions are as follows:

1. What were the challenges for effective coordination of the MNMCC?

Various challenges encountered during the earthquake of Nepal affected the coordination of the MNMCC. Coordinating smooth reception of the assisting teams, and response and relief materials were one of the significant coordination challenges. The delays in the customs process, and stockpiles of relief supplies in the airport indicates these coordination challenges. Similarly, economizing rescue and relief efforts and resources was another problem that came across. Likely, the overlap of efforts in certain areas, the absence of support in other sectors, and discontinuation in cooperation among the SAR team were some of the indicators reflecting coordination challenge. Difficulties in maintaining the NDRF's coordination and operating procedure was another coordination problems. In initial days, the OSOCC coordinated with the NEOC through the MNMCC. Thus, the lack of direct coordination between the On-Site Operation Coordination Center (OSOCC) and the National Emergency Operation Center (NEOC) indicated such coordination difficulties seen in the field.

Similarly, there existed coordination hitches in the form of not having enough knowledge of the situation on the ground, and the GoN not able to share sufficient information required to the arriving assisting troops. The ignorance of cultural values, arrival of supporting teams with inadequate or wrong equipment, and the failure of some assisting groups to remain self-sustained throughout the mission indicated a lack of

common situational understanding. The delay in the mobilization of assisting teams was another hindrance for effective coordination. The late arrival of few teams with unsuitable equipment for the particular mission and lack of necessary coordination for timely transportation of supporting teams to affected area indicates such coordination hindrance. Likewise, the MNMCC faced problem in coordination due to the lack of adequate coordination at a higher level. The failure to utilize two U.K's Chinook helicopters, and difficulty in gaining overflight clearance indicated such problems.

2. What were the factors leading to challenges for effective coordination?

Chapter 4 analyzed various factors that led to the challenges for effective coordination of the MNMCC. One of the main factors creating problems was the existence of certain gaps in international guidelines such as the Oslo guidelines, International Search and Rescue Advisory Group (INSARAG) guidelines, and the MNMCC Standing Operating Procedure (SOP). Likewise, gaps in provisions of the National Disaster Response Framework (NDRF) also resulted in coordination complications, specifically the coordination of the MNMCC with the NEOC, and the OSOCC.

Regarding organizational set-up, the lack of information management cell was a major contributor in generating difficulties to the MNMCC's coordination. Likewise, the NEOC's failure to update the Logistics Capacity Assessment (LCA) increased coordination hassles from the beginning, as the assisting teams had very unauthentic information regarding the actual situation and the requirements. The delay in the establishment of the OSOCC resulted in overwhelming coordination requirement, and complicated the coordination of the MNMCC. The MNMCC was also coordinating the

non-military SAR teams which added overstrained task to it. Likewise, NDRF's provision of establishing a command center for SAR at the NEOC increased the difficulties for coordination, as it was created lately and was not effective. Likewise, lack of the effective airport coordination cell specifically, the ineffectiveness of ground holding organization severely hampered the MNMCC in coordinating the efforts of the assisting military teams.

There were various leadership and education related factors leading to such coordination challenges. The lack of awareness, education, and incompetence of airport officials and Foreign Ministry leadership are examples of them. In addition to it, the lack of education and training, and the lack of supervision of the airport administration also contributed in this regard. The leadership of incoming assisting teams also contributed to such difficulties, as many of them seemed to lack adequate knowledge regarding entry requirements and procedure. Most of all, the lack of information management by the NEOC deprived the assisting teams of gaining situational update, and it was one of the crucial factor leading to the coordination challenge. The international media further complicated this deficiency of adequate information by exaggeration and portraying the need of SAR efforts even after seventy-two hours of the earthquake. Thus, it added a challenge to the MNMCC and the OSOCC to coordinate the relief effort required at that period. Similarly, the minimum prior coordination and interoperability between the GoN and the potential supporting nations increased the coordination hassles. The delay of the leadership to establish the OSOCC and absence of the GoN's senior leadership during the initial period of disaster response also greatly increased the coordination dilemmas of the MNMCC.

Finally, in terms of policy, absence of bilateral and multilateral agreements, and failure to establish South Asian Association for Regional Cooperation's disaster management rapid action force denied the opportunity of having smoother coordination with the assisting teams from those nations. The absence of policies to lift the restrictions on flight over the Indian airspace also contributed much in this regard. Likewise, inadequacy of media policy to manage the information and ineffective custom policy are some other contributing factors. The gap in the international disaster related guidelines, and ignorance of those guidelines increased coordination problems. Similarly, lack of the NDRF's provision to coordinate the non-military efforts in absence of the OSOCC was another prominent factor that lead to coordination challenge of the MNMCC.

3. What were the best practices in functioning of the MNMCC that are to be retained for future operations?

Some best practices of the Philippines during their response to the Typhoon Hagupit are beneficial for Nepal to implement during future responses. The early establishment of the MNMCC, prior bilateral and multilateral agreements with potential supporting nations, conduct of disaster related exercises, and availability of multiple transportation access for receiving assistance are some of the important best practices of the Philippines during response to Typhoon Hagupit. Similarly, there were few best practices of Nepal during the disaster response that are to be retained and institutionalized for future disaster responses. Conduct of various disaster related exercises including Program for Enhancement of Emergency Response (PEER), early establishment of the MNMCC, coordination of non-military assisting teams in absence of the OSOCC, and

establishment of the Joint Coordination Center (JCC) were some of the best practices that Nepal should retain for future disaster responses.

4. What measures are required to improve the coordination of the MNMCC?

Various measures as suggested in Functional Solution Analysis (FSA) in chapter 4 are required to improve the coordination of the MNMCC. The best practices included in the FSA should be institutionalized for the future responses. In addition to best practices, various other solutions related to the doctrine, organization, leadership and education, and policy domain in chapter 4 should also be considered as measures to improve the coordination of the MNMCC. The recommendation section of this chapter will cover the detail of such measures.

Thus, this thesis analyzed the four secondary questions in order to determine the measures as required by the primary question. This thesis has used the case study research methodology with Capability-Based Assessment (CBA) approach. My engagement in this thesis and the research process yielded me certain personal insights and growth. I learned that there are more indirect than direct factors affecting the coordination. Coordination of multi-national military effort should be more of a proactive than a reactive approach. I learned that prior engagements in the form of various agreements, training, exercises, and seminars are vital for disaster response coordination. Likewise, regarding research process, I further learned that CBA is primarily the planning tool of the U.S. military; however, other nations and organizations can also apply this tool to analyze the wide range of problems related to military and non-military issues. It helps not only to identify the problem and determine the solution, but also contributes to

direct the recommendation to the responsible decision maker, thereby making most out of the research.

Recommendations

The Functional Solution Analysis (FSA) in chapter 4 provided evaluated solutions (Feasibility, acceptability, and suitability) categorized in DOLP domain; however, it still needs further refinement by categorizing it into short-term and long-term actions to recommend to the key decision makers. According to the NDRF, the NA establishes the MNMCC and it directly coordinates with the NEOC, and the NEOC is directly under the Central Natural Disaster Relief Committee (CNDRC) chaired by Ministry of Home Affairs (MoHA). Thus, this thesis has considered the NA and the GoN as two important decision makers for recommending short-term and long-term actions. The following paragraphs provide prioritized short and long-term recommended action to the GoN and the NA.

Priority I Recommended Short-Term Actions for the GoN and the NA

Priority I recommended short-term actions are the one, which is preferable to initiate and complete as soon as possible. One of the prominent priority I short-term recommended action is the information management. The GoN is also recommended to ensure that the NEOC updates its information management mechanism and assets. Likewise, NA is recommended to reorganize the MNMCC's organization to include the information management cell. The MNMCC can utilize such information management cell to ensure effective management, uniformity, and synchronization of information. This cell should closely coordinate with the NEOC and the OSOCC, and can have a

common information-sharing platform with the DMO of the NA. For better functioning at the Airport, the GoN is recommended to ensure that the CNDRC conducts necessary prior coordination with the customs authority to implement emergency custom policy during future disaster responses. Equally, the GoN and the NA is recommended to organize a separate airport cell under the MNMCC that would be responsible for airport liaison and logistic operations. The NA is further recommended to a small but permanent (long-term) staffing of the MNMCC to facilitate initial situational understanding during the establishment. The NA is also recommended to substitute the Brigadier General of the DMO designated at the command post within the NEOC with some other NA senior officer.

Priority I Recommended Long-Term Actions for the GoN and the NA

Priority I recommended long-term actions are the one which is preferable to be initiated as soon as possible; but, may take more time to accomplish, or may continue for a longer period. The major priority I Recommended Long-term Action is to continuously engage with national and international stakeholders to include disaster responders, non-government organizations, responding countries, regional organizations, and international organizations. The GoN is recommended to continuously engage potential responding countries to have as many disaster management related bilateral agreements as possible. Likewise, the GoN should utilize the regional and international forum such as the SAARC and the UN to continue to push and gain mutual agreement with India, and other neighbors regarding the overflight and other related issues. Equally, the GoN is recommended to continuously push stakeholders in various forums (regional and

international events) to amend various gaps in disaster management guidelines. Such forums should also be utilized to get consensus in establishing an interoperable monitoring system to track the use and allocation of military assistance.

Likewise, The GoN and the NA is recommended to engage the national disaster responders in various national and international joint training, seminars, and exercises to improve their interoperability. It also urges the GoN to clearly state a condition that the assisting team should be self-sustained during the disaster response. The GoN, and the NA are recommended to make a provision to include a JCC within the MNMCC.

Priority II Recommended Short-Term Actions for the GoN and the NA

Priority II recommended short-term actions are those which can be completed in brief period but, can be initiated only after priority I actions. Most of the recommended measures in this category are related to the GoN's effort to push the regional and international stakeholders. The GoN is recommended to continually engage its strategic tool to have pre-determined agreements with particular government/militaries regarding the assets that assisting nation can immediately mobilize. Furthermore, the GoN should coordinate with respective countries to avoid incidents related to cultural and religious sensitivities. Likewise, during various disaster-related seminars, exercises, and conferences, the GoN, and other the stakeholders should raise the issue that the SAR teams should not leave behind the human remains. Equally, the GoN and the NA is recommended to ensure that disaster response-related training and exercises should include plans for recovering human remains without burdening SAR teams. The GoN is also recommended to push the Residential Coordinator (RC) of the UN, and other

stakeholders to ensure the early establishment of the OSOCC. Likewise, the GoN is recommended to list out the custom requirements during its request for international assistance.

Priority II Recommended Long-Term Actions for the GoN and the NA

Priority II recommended long-term actions are the one that can be initiated after priority I recommended actions, and takes a longer time to complete. The GoN and the NA is recommended to ensure that the international media gets enough information. The GoN, and or the MNMCC in coordination with the OSOCC should be early in disseminating necessary information through various media conferences, press releases, and other media interactions to proactively engage international media. Nepal should have an alternative runway that has a capacity to receive the international assistance; so, the GoN is recommended to take necessary actions to speed up the ongoing construction of international airports in Bhairawa, and Pokhara. The NA is recommended to ensure that during future disaster responses, the MNMCC coordinates with the OSOCC to organize a follow-up team to support those SAR team that are limited to search and rescue survivors only. Likewise, the MNMCC is recommended to ensure that the liaison officers have detail knowledge about the custom requirements, and can act respectively. Finally, the GoN and the NA is recommended to plan to establish regional MNMCC to ensure decentralized coordination.

Recommendations for Future Researchers

In addition to recommendations explained earlier, future researchers should consider the following recommendations.

1. The thesis is limited in focusing to doctrine, organization, leadership and education, and policy in the DOTMLPF domain. Therefore, next researcher can conduct additional studies in the remaining area.

2. The compound nature of the disaster response task, and it being the non-traditional job for the regular militaries creates complication in coordination. Thus, future research should determine the possibility of establishing a multinational coordination center to coordinate military and nonmilitary armed forces efforts, instead of restricting it in the coordination of the multinational militaries' efforts. Such future research can examine the leadership and the organizational structure of the multi-national armed forces coordination center that could be more inclusive concerning involving members of other armed forces such as the police forces and the paramilitary forces.

3. Likewise, next researcher can conduct a study on the possibility of establishing disaster response paramilitary force in Nepal that can efficiently operate under the MoHA. It can avoid the current dilemma where the NA under the Ministry of Defense has to mobilize its resources under the leadership of MoHA. Thus, for this amendment reference of the National Disaster Response Force of India can be taken into consideration.

4. The study is directed from the MNMCC perspective; thus, subsequent research can focus on the similar issue from the OSOCC's and or the NEOC's perspective.

5. This study is limited to the secondary data. Therefore, future researchers can conduct similar research by collecting primary data from the military and non-military individuals, and organizations that were directly involved in disaster response during the earthquake of Nepal.

APPENDIX- A

THE CONTRIBUTION OF THE MNFs

MNFs Status

On the request of Government of Nepal, 34 countries had sent their assistance in the form of skilled manpower with the necessary equipment for search and rescue (SAR) as well as medical support. See Table 2 for the details of participation of various countries SAR, medical, engineer and humanitarian assistance.

Participation of Various Countries			
S.N.	Types of Support	Numbers of Person	Numbers of Countries Involved
1.	SAR	1369	11
2.	Medical	814	12
3.	Engineer/ HA	1580	7
4.	Air	412	3
	Total	4175	

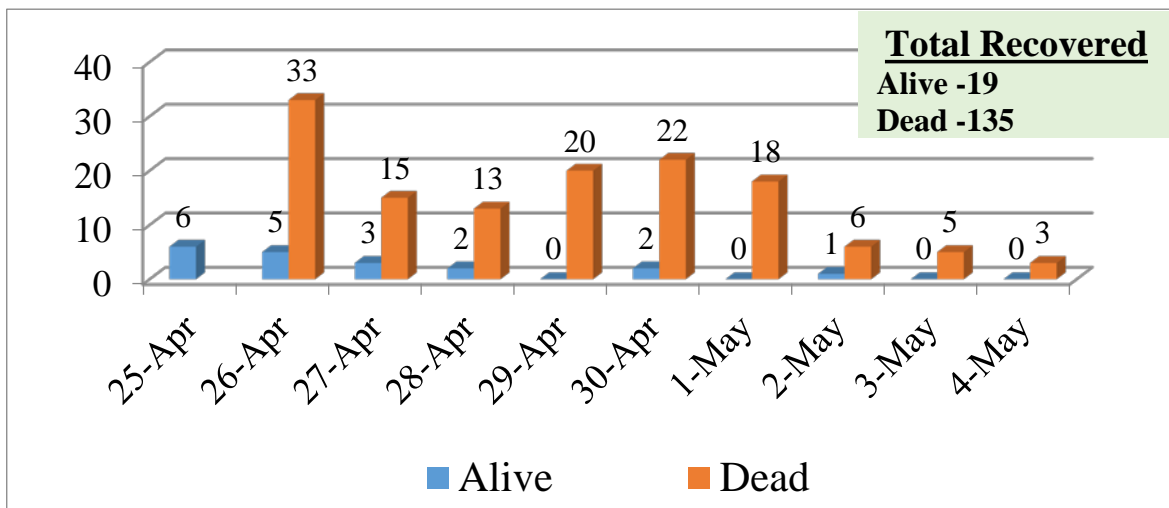
Source: Sangeet Pun, Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt (Kathmandu: Army Command and Staff College, 2016), 29.

Duties/ Tasks Performed

MNFs were tasked both outside and inside the Kathmandu valley for the search and rescue, evacuation, distributing relief items, medical treatment in affected areas, depending on their capabilities. The various task performed by the MNFs are discussed below.

Search and Rescue (SAR)

Depending on the needs analysis of MNMCC, MNFs were allotted areas for the search and rescue operation. Military, Para military and Civilian SAR teams (18 SAR teams) of different countries participated in the SAR efforts. The rescue details by MNFs from collapsed structure are shown in the figure.



Persons Recovered by Search and Rescue efforts of MNFs.

Source: Colonel Naresh Subba, *Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt* (Kathmandu: Nepalese Army, 2015), 18.

Medical Treatment

For the treatment of injured victims in the affected areas, there were 813 military medical personnel from twelve countries China, Japan, Bangladesh, Bhutan, Canada, Israel, India, Indonesia, Thailand, Sri Lanka, Pakistan and Singapore. Similar to the SAR efforts, they were concentrated mostly inside the valley and only few teams operated their mobile medical in Gorkha, Dhading, Sindhupalchow and Dolakha districts. The MNFs medical team treated 22,583 patients including 1,481 operation treatments (Nepalese Army 2015).

Engineer Support/HA

The MNFs having engineering capability assisted in constructing shelters, road opening, debris clearance, damage assessments and stabilizations works in and around Kathmandu valley. Details of their assistance are as follows:

1. Road Clearance: The damaged section of Araniko Highway, Tatopani-Bharabishe was cleared by the Chinese Armed Police Forces. Similarly, road in Shipaghat area, Sukute area and Sankhu area was opened by the light engineering team of Sri Lanka, Canada and India.
2. Debris Clearance: Engineering team from India, Pakistan, and Canada were involved in debris clearance along with NA in Bhaktapur, Dallu and Sankhu area.
3. Damage Assessment: The engineering teams from Israel carried out damage assessment inside Kathmandu Valley.

Air Operations

The air assets of NA army together with civilian airlines played crucial role in rescue, evacuation, providing relief material in remote areas but were not sufficient in order to meet the demands. The air assets available from the MNFs played an important role in the rescue and relief operations in remote areas of Dolkha, Ramechhap, Sindhupalchok, Dhading, Nuwakot, Gorkha, Rasuwa districts. See table 3 for the details of air assets provided by MNFs.

Air Assets of Participating MNFs		
SN	Country	Air Assets
1.	India	8 x MI 17 5 x ALH
2.	China	3 x MI 17
3.	USA	3 x UH -1 Helicopter 4 x V-22 Osprey

Source: Sangeet Pun, Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt (Kathmandu: Army Command and Staff College, 2016), 31.

APPENDIX B

DETAIL STATUS OF MNF'S PARTICIPATION

Detail status of MNF's participation as of 12 may 2015							
S.N.	Country	Arrival	Types				Total
		Date	SAR	Med	Air	Engr/ HA	
1.	Poland	27-Apr-15	81	0	0	0	81
2.	Malaysia	28-Apr-15	47	0	0	0	47
3.	Singapore	28-Apr-15	130	16	0	36	182
4.	Bangladesh	26-Apr-15	0	19	0	0	19
5.	Algeria	1-May-15	73	0	0	0	73
6.	Spain	3/5/2015	60	0	0	0	60
7.	Israel	28-Apr-15	59	124	0	103	286
8.	Sri Lanka	26-Apr-15	0	44	0	97	141
9.	Thailand	29-Apr-15	17	37	0	0	54
10.	Indonesia	30-Apr-15	54	51	0	0	105
11.	Pakistan	28-Apr-15	35	49	0	0	84
12.	Bhutan	27-Apr-15	0	77	0	0	77
13.	Canada	29-Apr-15	0	27	0	136	163
14.	UK	27-Apr-15	0	0	0	46	46
15.	USA	28-Apr-15	0	0	286	0	286
16.	China	26-Apr-15	102	140	24	676	942
17.	India	25-Apr-15	711	116	102	486	1415
18.	Japan	26-Apr-15	0	114	0	0	114
		Grand Total	1369	814	412	1580	4175

Source: Sangeet Pun, Nepal Earthquake 2015: Nepalese Army Experience and Lessons Learnt (Kathmandu: Army Command and Staff College, 2016), 31.

APPENDIX C

EVALUATED SOLUTIONS

Doctrine Related Evaluated Solutions

1. The NA should substitute the Brigadier General of the DMO designated at the command post within the NEOC with some other NA senior officer.
2. The GoN, and or the MNMCC in coordination with the OSOCC should be early in disseminating necessary information through various media conferences, press releases and other media interactions to proactively engage international media.

Organization Related Evaluated Solutions

1. Nepal should have alternative runway that has a capacity to receive international assistance.
2. The NDRF of Nepal should have a provision to design a JCC within the MNMCC, which is the MNMCC term for restructured HuMOCC.
3. The MNMCC and the OSOCC can coordinate to organize a follow on team to support those SAR team that are limited to search and rescue survivors only.
4. For effective management, uniformity and synchronization of information, the MNMCC in coordination with the NEOC and the OSOCC should have its own information management cell. Likewise, the MNMCC should have a common information-sharing platform with the DMO of the NA.
5. It is better to have a separate airport cell under the MNMCC that would be responsible for airport liaison and logistic operations.

6. It is better to have small but permanent (long-term) staffing of the MNMCC to facilitate early situational understanding once it is established

7. NA and the CNDRC should have plan to establish regional MNMCC.

Leadership and Education Related Evaluated Solutions

1. Nepalese disaster responders should continue to conduct various joint trainings, seminars, exercises, and improve their interoperability. Likewise, such exercises should include plans for recovering human remains without burdening SAR teams.

2. The NEOC should update its information management mechanism and assets.

3. The CNDRC should conduct prior coordination to ensure that the custom authority would implement emergency custom policy during future disaster responses. Likewise, the GoN should list out the custom requirements during its request for international assistance.

4. The MNMCC can ensure that the liaison officers have detail knowledge about the custom requirements, and can assist respective assisting militaries.

Policy Related Evaluated Solutions

1. The GoN can take additional initiatives to engage potential responding countries to have as many disaster management related bilateral agreements as possible. Likewise, the GoN should utilize the regional and international forum such as the SAARC and the UN to continue to push in gaining bilateral agreement with India, and other neighbors regarding the overflight and other related issues.

2. The GoN should push stakeholders in various forums to amend various gaps in disaster management guidelines. Such forums should also be utilized to get consensus in

establishing an interoperable monitoring system to track the use and allocation of military assistance.

3. The GoN should continually engage its diplomatic tool to have pre-determined agreements with specific government/militaries regarding the assets that assisting nation can immediately mobilize.

4. During various disaster related seminars, exercises, and conferences, the GoN, and other the stakeholders should raise the issue that the SAR teams should not leave behind the human remains.

5. The GoN should push the Residential Coordinator (RC) of the UN, and other stakeholders to ensure early establishment of the OSOCC.

6. While the GoN request for the international assistance for disaster response, the GoN should state a condition that the assisting teams should be self-sustained.

7. The GoN should coordinate with respective countries to avoid incidents related to cultural and religious sensitivities.

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